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Nathan Associates Inc.
Economic and Management Consultants
Washington, D.C.

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INTRODUCTION

Study Objectives and Scope

The broad objective of the Guatemala Transportation and Telecommunications Infrastructure Study (GTTIS) was to ascertain whether and to what extent existing transportation and communications infrastructure, and government policies and regulations regarding the transportation and communications sectors, are acting to restrain real economic growth in Guatemala. Specifically, GTTIS was asked to determine the following:

- The extent to which available transportation and communications services in Guatemala are inadequate.
- Whether the costs of providing appropriate transportation and communications services in Guatemala might be significantly higher, and/or the quality of services might be significantly lower, than transportation and communications services provided in other countries, particularly in other Central American countries and in Colombia.
- Whether Guatemalan law, regulations, policies, or ingrained practices impede the private sector from supplying adequate transportation and communications services at internationally competitive prices.

From discussions between the client and the consultants early in the study, it was agreed that GTTIS investigative emphasis would be placed on identifying the constraints placed on export growth and new investment by inadequate air and sea transport and telecommunications infrastructure and operations, and by government policies and practices regarding these

subsectors. Where such constraints were identified, GTTIS was to quantify, to the extent possible, the effects of the constraints on export growth and on investment, and to identify and assess possible measures to reduce or eliminate the constraints and their adverse effects on economic growth. The scope of work for GTTIS is presented in Appendix A of this report.

Study Approach

The approach taken for the conduct of GTTIS was as follows:

- The Guatemalan economy was first examined to ascertain the extent of recent growth, especially in the export sector and in capital formation.

- To the extent that growth may have been slow (and suggestive of constraints or impediments to more rapid growth), GTTIS attempted to identify whether controlling constraints lie outside the transportation and communications sectors.

- The transportation sector was examined to ascertain whether or not the availability, quality, and/or costs of services have limited the growth of exports generally, or limited growth for particular export commodities, commodity groups, or geographic areas of Guatemala. In examining transport costs, GTTIS considered the possibilities that poor infrastructure, poor operating efficiency, inappropriate structure of the transport industry, and/or government regulatory interference with the industry could result in excessive charges to shippers, thus impeding export growth and discouraging investment in export or other sectors. GTTIS assessed the reasonableness of transport charges on the basis of the proportions that those charges represented of total export CIF value, and also by comparing charges to those prevailing in other Central American countries and in Colombia.

- The telecommunications sector was examined to ascertain whether or not the availability, quality, and/or costs of services have limited the growth of investment in Guatemala generally, or in certain areas of the country.

- Where GTTIS determined that the transportation and telecommunications sectors, as they are currently constituted, do in fact constrain export and investment growth, efforts were made to ascertain and assess the efficacy of any ongoing and planned measures by the Guatemalan public and private sectors to modify these sectors in order to remove those constraints.

- Finally, GTTIS identified and assessed further measures, beyond what is ongoing and planned, to more completely remove constraints on export and investment growth imposed by existing inadequacies in the transportation and telecommunications sectors.

As an indication of whether charges for international shipping services, air cargo services, and telecommunications services available to the Guatemalan export sector are reasonable or excessive, GTTIS made comparisons with the charges imposed for such services in other Central American countries and in Colombia. Colombia provides an especially useful comparison because of the success of its export market. Although the world press is most aware of Colombian export success in the international drug market, Colombia is achieving major successes in more widely acceptable markets, including the markets for perishable agricultural commodities. Colombia is now second only to the Netherlands among the world's suppliers of fresh cut flowers. In 1986, Colombia realized $155 million from the country's international sales, primarily in the United States, of carnations, chrysanthemums, pompoms, and roses. Much of this success has resulted from the care and thoroughness with which Colombian flower producers (about 250 enterprises, most of which are wholly owned by Colombians) have approached the marketing effort; two Colombian flower outlets—Sunburst Farms and the Colombian Flower Exchange—have been established in the United States. Colombia is applying this same packaging and marketing know-how to the country's horticultural export industry.

Costa Rica has also become a sophisticated exporter, and it is particularly these two countries—Colombia and Costa Rica—with export sector performance worthy of emulation, that provide useful comparisons for ascertaining how the Guatemalan export sector might develop, and what constraints the sector might need to overcome.

A final note on the GTTIS approach might be added here with regard to the northern portion of Guatemala (El Petèn); the area has good potential for forestry and agricultural development, but currently is largely undeveloped, supporting a population of less than 300,000. As forestry resources approach depletion elsewhere in Guatemala, there is a clear danger that improved access to El Petèn, allied with the growing demand for

Guatemalan mahogany and furniture, could result in rapid depletion of El Petèn as well. In the view of GTTIS, an El Petèn regional development study is urgently needed to identify an optimal scheme for development, with specifications of governmental controls to minimize the adverse effects of development on the environment. Once such a study has been completed, its recommendations have been discussed and largely adopted, and desirable government controls are in place, then it would be appropriate to improve El Petèn internal transportation, transport access to other areas of the country and to foreign markets, and telecommunications connections. This combination of improvements should act to induce agricultural, industrial, and tourism investments, with good potential for export growth and foreign exchange earnings from both exports and tourism. In the current report, however, GTTIS examines only briefly the transportation and telecommunications facilities and services providing El Petèn with means of internal and external trade and communication.

Report Organization

Chapter 2 of this report discusses the Guatemalan economy, particularly the export sector. GTTIS assessed the extent to which controlling constraints on export growth lie outside the transport sector and examined the organization of the export sector and its current and prospective capacity to effectively compete for markets. That capacity was judged according to product and packaging quality and the adequacy of marketing activities, including arranging for timely and appropriate transportation at reasonable costs. Chapter 3 presents an overview of the Guatemalan transportation sector, identifying its overall role in the economy and with regard to the export sector, and identifying, as well, the modal systems and individual terminal facilities. Chapter 4 discusses, briefly, the services provided by surface transport facilities and the adequacy of those services and facilities. Chapter 5 presents a more complete analysis of the sea transport subsector, discussing especially the effects that inadequacies in service and high transport costs have on the growth of Guatemalan exports. Chapter 6 concerns air transport, with the discussion focused on international air cargo services available to Guatemalan exporters, the needs for service improvements, and possibilities for cost reductions. The Guatemalan telecommunications system, services, and policies are discussed in Chapter 7, with an assessment of how current service inadequacies and pricing policies might be adversely affecting investment in Guatemala. GTTIS findings and recommendations are presented in Chapter 8. The report concludes with two appendices; the scope of work for GTTIS is presented as Appendix A, and Appendix B contains a discussion of the findings of a January 1990 study of Guatemala's principal airports.

Chapter 2

2. THE GUATEMALAN ECONOMY

Size and Structure of the Economy

Although Guatemala ranks third among Central American countries in area (both Honduras and Nicaragua are larger), it ranks first in size of population and economy. The population is approaching 9 million, and the GNP, in 1989, was nearly 24 billion quetzales. Roughly, the per capita GNP is U.S. $1,000.

Table 1 indicates the composition of GDP in each year of the 1980s, expressed in constant 1958 quetzales. As shown in the table, the Guatemalan economy suffered a decline, in real terms, from 1983 to 1986 compared with 1980 to 1982; since 1986, however, economic growth has recommenced, with growth of 3.5 percent in 1987, 3.9 percent in 1988, and nearly 4.0 percent in 1989, compared with the preceding years. Stagnation resulted largely from a steep decline in investment: the 1984-1986 average was only about 60 percent of the 1980-1982 average. Public investment fell especially steeply during 1985-1986, with average annual public investment just 35 percent of the 1980-1982 average. From 1986 to 1989, there was a swing back to increased investment, with public investment during the 3-year period expanding by 56 percent, private investment growing by 32 percent, and combined, total investment increasing by 38 percent. Both exports and imports declined as proportions of GDP during the decade of the 1980s, but both have rebounded somewhat from their nadirs in 1986. During the 3 years 1987 to 1989, imports and exports grew each year; the real value of exports in 1989 was 27 percent above the 1986 level, and imports grew 63 percent over the same period. Nevertheless, the 1989 foreign trade levels were substantially lower than the real value levels of 1980 and 1981. In 1980, exports represented 21.0 percent of GDP and imports represented 14.2 percent; nine years later, the respective percentages were 15.1 percent and 10.6 percent.

Table 2 indicates the breakdown of GDP among sectors of the Guatemalan economy. Agriculture is Guatemala's most important economic

Table 1. Gross Domestic Product at Market Prices, 1980-1989

(thousands of 1958 Quetzales)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Private consumption	2,318,831	2,350,770	2,279,651	2,247,735	2,272,461	2,265,643	2,283,768	2,372,836	2,470,120	2,543,480
Government consumption	222,684	232,626	229,722	229,869	236,033	230,628	242,955	259,881	273,000	279,450
Fixed capital formation	372,592	401,472	357,665	258,193	234,935	220,153	228,558	266,133	299,830	316,580
Private	223,891	202,009	198,644	152,265	155,830	160,550	166,725	187,573	211,260	219,830
Public	148,701	199,463	159,021	105,928	79,105	59,603	61,833	78,560	88,570	96,750
Variation in stocks	(17,170)	8,344	(26,347)	16,970	57,137	15,899	8,038	47,331	10,350	(220)
Gross domestic expenditure	2,896,937	2,993,212	2,840,691	2,752,767	2,800,566	2,732,323	2,763,319	2,946,181	3,053,300	3,139,290
Exports of goods and services	651,134	557,408	510,170	454,693	440,184	454,017	390,455	413,999	437,310	494,090
Less: imports of goods and services	441,194	432,060	334,288	267,856	287,205	250,278	213,598	315,784	327,743	348,270
Gross domestic product	3,106,877	3,127,560	3,016,573	2,939,604	2,953,545	2,936,062	2,940,176	3,044,396	3,162,867	3,288,110

Note: 1989 data are preliminary.
Source: Central Bank of Guatemala.

Table 2. Gross Domestic Product
by Sector, 1987-1989

(millions of 1958 Quetzales)

	1987		1988		1989		Percent change	
	Value	%	Value	%	Value	%	1987-88	1988-89
Agriculture	782.4	25.7	816.1	25.8	844.6	25.7	4.3	3.5
Mining	8.4	0.3	8.8	0.3	9.1	0.3	4.8	3.4
Manufacturing	477.4	15.7	487.9	15.4	498.5	15.2	2.2	2.2
Construction	58 7	1.9	66.3	2.1	77.6	2.4	12.9	17.0
Utilities	68.2	2.2	73.8	2.3	79.9	2.4	8.3	8.3
Transport, storage, and communications	220.8	7.3	229.4	7.3	246.3	7.5	3.9	7.4
Commerce	752.8	24.7	776.1	24.6	805.6	24.5	3.1	3.8
Finance	114.9	3.8	121.6	3.9	127.9	3.9	5.8	5.2
Housing	161.1	5.3	164.2	5.2	167.7	5.1	1.9	2.1
Public administration and defense	210.2	6.9	217.9	6.9	224.9	6.8	3.7	3.2
Other services	189.5	6.2	196.2	6.2	202.6	6.2	3.5	3.3
Total	3,044.4	100.0	3,151.3	100.0	3,284.7	100.0	3.7	4.0

Note: Totals for 1988 and 1989 do not match exactly those reported by the Central Bank in Table 1. However, the sectoral distribution is believed accurate as reported.
Source: Central Bank of Guatemala.

sector, accounting for slightly more than one-quarter of GDP. The sector generates more than three-quarters of export income and employs somewhat more than one-half of the country's labor force. As shown in the table, the construction and utilities sectors experienced very rapid growth in 1988 and 1989, and the transportation and communications sectors also grew rapidly in 1989. Manufacturing grew only very slowly.

International Trade

The importance of Guatemalan agriculture as a generator of exports is shown in Table 3. In each year of the 1987-1989 period, agricultural exports represented approximately 79 to 80 percent of total Guatemalan exports. The importance of the United States as a trade partner is also pointed up in the table; over the 3-year period, combined exports to the United States were valued at U.S. $841 million, representing nearly one-third of total exports of U.S. $2,564 million, and imports from the United States totaled U.S. $1,420 million, representing 41.7 percent of total imports of U.S. $3,406 million. Table 4 provides greater detail on agricultural exports and the importance of the United States as a market for such exports.

The major, traditional exports of Guatemalan agriculture are coffee, bananas, sugar, and cotton; cotton exports have been declining for several years, but the other three traditional exports remain very important, and coffee in particular is important. The United States is the principal market for Guatemalan bananas, and an important market for Guatemalan coffee, but it imports only a relatively small proportion of Guatemalan sugar and does not represent a market for Guatemalan cotton. Of particular importance to GTTIS is the fact that the United States constitutes the principal market for Guatemalan perishable agricultural commodities, including 46 percent of fresh vegetables, 96 percent of fresh meat, 67 percent of fresh fruit and nuts, nearly 94 percent of seafood, and 58 percent of flowers. Table 5 provides a breakdown of Guatemalan agricultural imports.

Figures 1 and 2 provide information on the growth of trade between Guatemala and the United States over the 1983-1989 period. Figure 1 shows Guatemala-United States total trade, and notably, beginning in 1988 and continuing in 1989, Guatemala experienced trade deficits with the United States. Figure 2 indicates how Guatemalan nontraditional exports to the United States have been rising, both in absolute terms and as proportions of total exports to the United States.

Table 6 provides a detailed time series of total Guatemalan exports, with value expressed in Guatemalan quetzales. Although overall exports declined over the period, there was noteworthy growth of a number of perishable agricultural exports, including seafood, prepared fruits, and vegetables and legumes; exports of fresh beef have rebounded well from

Table 3. Foreign Trade, 1987-1989

	1987	1988	1989[a]
	Millions of U.S. Dollars		
Total Foreign Trade			
All countries			
Exports (FOB)	981.0	1,021.7	560.8
Imports (CIF)	1,449.0	1,156.9	799.7
Balance of Trade	-468.0	-135.2	-238.9
U.S. only			
Exports (FOB)	399.0	281.0	161.4
Imports (CIF)	558.0	579.8	282.6
Balance of Trade	-159.0	-298.8	-121.2
Agricultural Trade[b]			
All countries			
Exports (FOB)	786.5	805.9	441.7
Imports (FOB)	167.7	172.0	97.8
Balance of Trade	618.8	633.9	343.9
U.S. only			
Exports (FOB)	375.6	254.7	136.4
Imports (CIF)	102.5	86.6	39.6
Balance of Trade	273.1	168.1	96.8
	Percentages		
Importance of Agriculture in Guatemala's Trade Relations			
All countries			
Exports	80.2	78.8	78.7
Imports	11.6	14.9	12.2
U.S. only			
Exports	94.1	90.6	84.5
Imports	18.4	14.9	14.0
Importance of U.S. Trade in Guatemala's Trade Relations			
Total trade			
Exports	40.7	27.5	28.8
Imports	38.5	50.1	35.3
Agricultural trade			
Exports	47.8	31.6	30.9
Imports	61.1	50.3	40.5

[a]Based on data from January to June provided by the U.S. Embassy.
[b]As defined by Agricultural Attaché Office.
Source: Central Bank of Guatemala.

Table 4. Agricultural Exports by Commodity, 1988-1989

Product	Value of Exports (millions of U.S. dollars) 1988	1989	Exports to United States as percentage of each group (1988)
Coffee	349.6	366.1	26.3
Bananas	63.2	79.0	71.4
Sugar	72.5	88.4	13.6
Prepared foods	53.0	34.6	30.9
Cardamom	33.6	26.9	5.1
Vegetables, fresh	21.0	25.0	45.9
Cotton	41.4	34.5	0.0
Wood products	14.4	12.5	37.3
Cotton products	7.6	7.2	42.2
Essential oils	16.6	17.7	7.2
Sesame seeds	14.9	15.8	28.5
Tobacco and products	18.9	19.5	62.8
Meat, fresh (beef, poultry, other)	19.0	24.3	96.3
Rubber and products	11.8	10.7	1.6
Fruit and nuts, fresh (excluding bananas)	11.6	12.3	66.7
Seafood, shrimp, lobster, other	6.6	15.6	98.6
Flowers, bulbs, and ornamental plants	9.2	15.5	58.2
Molasses	9.2	10.0	93.5
Sugar products	7.2	7.5	30.9
Other	34.9	33.3	14.9
Total	815.8	802.7	31.2

Source: Government of Guatemala customs data, as reported by the Central Bank and compiled by the U.S. Agricultural Attaché Office.

Table 5. Agricultural Imports, 1988

Product	Value of imports ($000s)	Percentage of total dollar value	Value of imports to United States ($000s)	Imports to United States as percentage of each group
Prepared foods	34,551	20.1	11,532	33.4
Wheat	19,240	11.2	18,728	97.5
Vegetable oils (including palm)	19,247	11.2	7,542	39.2
Dairy products and eggs	12,360	7.2	2,543	20.6
Tallow	14,065	8.2	14,065	100.0
Animal feed ingredients (excluding grains)	8,437	4.9	7,396	87.7
Essential oils	11,171	6.5	4,020	35.9
All other grains (excluding wheat)	9,116	5.3	7,534	82.7
Flour and other grain products	7,162	4.2	2,634	36.8
Beverages	4,867	2.8	282	5.8
Cotton products	4,856	2.8	1,004	20.7
Rubber and products	3,962	2.3	1,721	43.4
Sugar products	3,269	1.9	479	14.7
Planting seeds	2,453	1.4	1,868	76.2
Wood products	3,075	1.8	1,275	92.9
Fruits and nuts, fresh (excluding bananas)	1,373	0.8	1,471	15.3
Poultry (including eggs for reproduction)	1,810	1.0	1,301	71.9
Other	10,967	6.4	2,093	19.1
Total	171,951	100.0	86,488	50.3

Source: Government of Guatemala customs data, as reported by the Central Bank and compiled by the U.S. Agricultural Attaché Office.

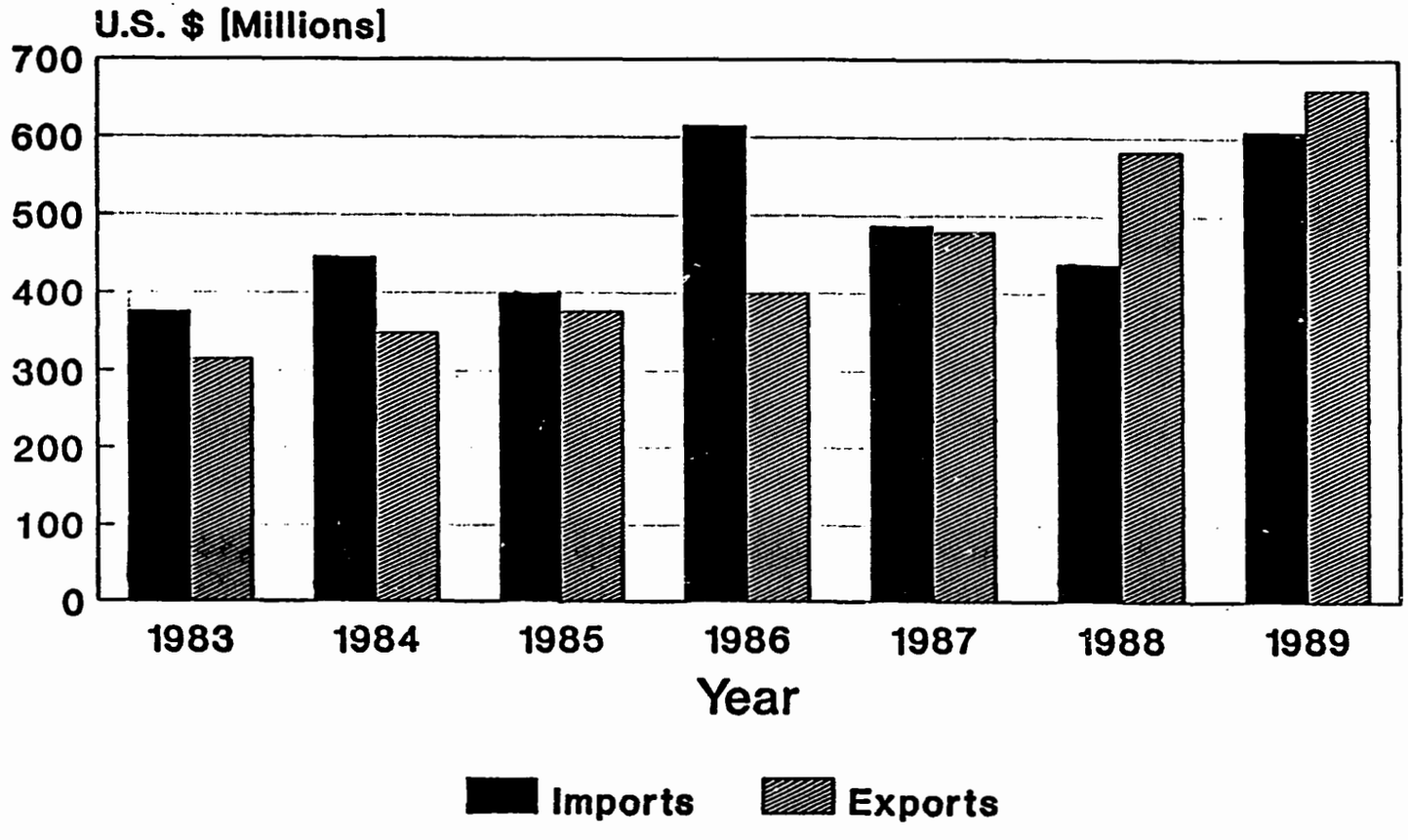

Figure 1 U.S. Exports and Imports from Guatemala (Source: U.S. DOC-1990)

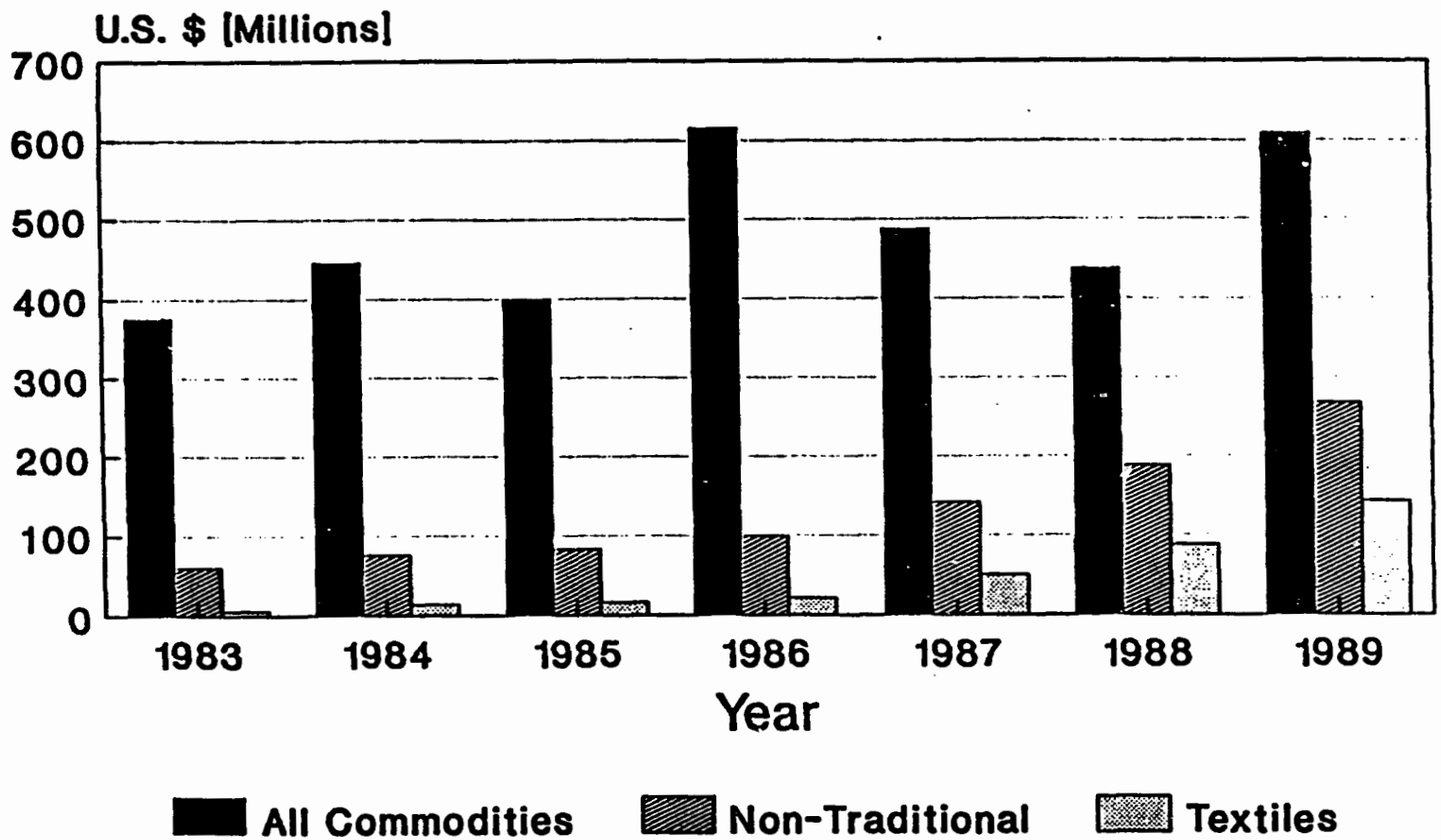

Figure 2 U.S. Imports from Guatemala (Source: DOC:1990)

Table 6. Value of Guatemalan Exports
(thousands of Quetzales)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989[a]
Traditional Products	853,062	648,996	611,903	668,384	667,371	657,103	748,611	585,076	590,868	544,830
Cotton	165,326	127,578	78,534	46,077	70,427	59,823	27,548	17,470	40,270	23,726
Sugar	69,258	85,205	23,196	126,770	74,573	44,211	50,816	53,507	71,331	84,616
Bananas	46,775	55,698	60,254	38,458	56,634	62,000	71,269	72,470	61,651	61,460
Coffee	463,913	294,826	358,828	350,699	360,700	411,401	522,339	370,890	349,524	318,342
Cardamom	55,551	34,306	29,688	31,403	59,407	58,753	45,804	43,494	33,636	21,665
Beef	28,508	29,275	15,263	14,945	11,629	8,962	3,824	11,393	19,025	20,407
Petroleum	23,731	22,118	46,141	60,033	34,000	11,954	27,012	15,852	15,431	14,615
Central America	440,823	378,913	337,347	320,924	291,433	207,757	185,043	230,558	236,441	207,687
Nontraditional products	225,949	198,203	170,522	169,497	163,482	155,711	127,984	171,599	194,395	183,772
Essential oils	2,678	2,464	2,165	1,692	1,661	1,585	1,509	1,744	2,365	2,033
Live animals	320	17,954	10,484	38	-	-	-	-	-	-
Sesame	10,046	15,626	9,674	09,016	11,462	10,151	11,934	12,484	14,145	13,310
Cotton derivatives	5,388	5,314	2,772	451	1,793	1,194	792	634	1,059	1,356
Clothing	1,776	1,697	1,172	1,772	3,132	3,099	5,751	6,383	8,491	7,878
Handicrafts	776	695	744	802	844	690	646	297	666	1,054
Cocoa	2,489	427	44	1,120	2,031	651	1,208	3,917	1,453	368
Shrimp, fish, lobster	5,781	11,275	8,363	8,779	10,905	9,141	8,062	12,860	14,529	13,633
Natural rubber	6,024	6,508	3,713	5,534	7,205	6,010	5,005	6,809	8,326	5,976
Chewing gum	355	-	677	724	760	-	-	-	-	-
Flowers, plants, and seeds	10,640	10,545	9,678	8,381	10,787	10,429	9,113	11,303	12,164	10,575
Prepared fruits	2,149	2,177	1,829	2,204	2,239	3,253	6,081	8,350	11,798	12,487
Wood and manufacture	1,931	5,147	3,231	1,594	1,801	2,622	5,453	9,760	12,634	7,825
Honey	2,510	2,814	2,405	2,927	2,312	2,134	2,267	2,113	1,769	1,006
Molasses	5,445	11,728	4,927	2,339	4,742	6,121	5,771	8,235	9,226	10,356
Minerals	2,979	1,927	1,134	317	522	1,378	2,514	2,236	1,511	1,079
Nickel	59,100	-	-	-	-	-	-	-	-	-
Food products	8,474	9,022	5,657	4,547	7,285	6,678	7,187	11,518	9,091	8,787
Glass products	2,847	1,368	1,402	705	1,696	3,619	3,501	3,608	4,912	3,621
Metal products	3,159	2,395	1,036	629	816	662	893	1,953	1,175	3,621
Chemical products	26,737	26,472	27,287	24,747	23,981	24,105	20,935	24,501	20,902	18,280
Tobacco, leaf and manufactured	14,601	15,949	17,729	13,326	16,099	13,106	10,612	11,287	17,214	18,159
Textiles, fabrics	7,850	3,760	3,897	2,549	4,882	2,654	2,336	8,767	6,484	6,232
Vegetable and legumes	7,061	8,379	10,613	9,407	11,399	10,343	11,100	16,189	17,588	17,518
Others	15,413	12,527	7,936	6,677	6,314	7,737	5,314	6,752	16,895	18,620
Re-exports	19,421	22,035	31,953	59,222	28,814	28,352	-	-	-	-
Total	1,519,834	1,226,113	1,119,773	1,158,806	1,122,286	1,020,572	1,061,638	987,333	1,021,704	936,289

[a]Data are through October 1989.
Source: Customs declarations reported to Central Bank of Guatemala.

their 1986 nadir, but have not yet reattained 1980-1981 levels. A principal concern of GTTIS was to ascertain whether transportation inadequacies, to the extent that such exist, have hindered in the recent past or might impede in the near future the growth of these nontraditional, perishable agricultural commodity exports. Other nonperishable, nontraditional commodities that exhibited good export growth during the 1980s include clothing, textiles, glass products, wood products, and molasses.

Prospects for Export Growth

GTTIS inquired into the possibility that transportation and telecommunications inadequacies in Guatemala might impede the country's export growth, but a number of other factors could also impede the growth of exports. Some of these potentially growth-inhibiting factors are Guatemalan resource limitations, import absorption limitations of overseas markets and competition among suppliers for these markets, poor export sector organization and lack of effective marketing strategies, adverse effects of government policies and regulations with regard to the export sector, and growth of domestic demand for export commodities. These possible constraints to export growth are considered below, in brief discussions of important Guatemalan export commodities.

Coffee

The dominant agricultural commodity in Guatemala is coffee; this commodity brings in one-third or more of Guatemala's export revenues, in every year, and accounted for just under one-half of total export receipts in 1986. Coffee-growing also employs about one-quarter of the Guatemalan labor force. The coffee is grown mainly in the western hills, at altitudes of above 1,000 feet, and approximately one-half of the coffee is premium, high-altitude (above 4,000 feet) coffee. Production in these areas is dominated by a relatively small number of large and efficient coffee fincas (mountain farms); it is estimated that just 5 percent of all coffee-growing fincas in Guatemala produce 75 percent of the nation's coffee and 90 percent of coffee exports. Although this export subsector is normally heavily influenced by world market constraints from the international coffee agreement, the failure of producer and consumer nations to reach a consensus on extending this agreement has temporarily left Guatemala (and other producers) free to expand production and sales without restraint. In early 1990, this situation has acted to the advantage of the Guatemalan coffee industry, and producers are responding with a surge in exports. Some observers maintain that Guatemalan coffee has a quality/taste advantage that should permit the country to increase and hold its world market share, pending any international adjustments that might eventually be agreed upon by producer and consumer nations.

Bananas

Bananas have been an important Guatemalan export for more than 100 years. Production is mainly in the tropical lowlands along the Caribbean coast. Export tonnages in recent years have averaged about 330,000 tons per annum, which is down by about 100,000 tons from the levels of the early 1980s. The largest single producer is BANDEGUA, a subsidiary of Del Monte. Other producers have banded together to form COBIGUA, for the purpose of marketing and shipping their production. As indicated in Table 4, approximately 70 percent of Guatemalan banana exports are destined for the United States.

Sugar

Sugarcane is grown on the Pacific slopes and lowlands of southern Guatemala. Nearly 1 million persons (roughly 12 percent of the total population of the country) are employed in the fields and processing plants during the 5-month harvest season. Most of the 15 processing mills are located in the Escuintla area, roughly midway between Guatemala City and the Pacific Ocean. Prior to 1985, the United States was the most important single market for Guatemalan sugar. However, the growth of consumption of nonsugar sweeteners and the corresponding decline of sugar imports into the United States have significantly diminished the U.S. demand for Guatemalan (and other producer countries') sugar. Nevertheless, Guatemala has continued to export an average of about 60 percent of its annual sugar crop (of around 650,000 tons) each year. Prospects for expanding sugar exports, however, cannot be considered good.

Cotton

Cotton has long been one of Guatemala's four principal export crops, but export volumes have fallen off sharply in recent years; whereas Guatemala exported a total of 164,000 tons in 1978, exports had declined to only around 30,000 tons by 1989. Reportedly, cotton production declined because of the squeeze between falling international prices for cotton and rising prices for fertilizer. Despite these recent trends, Guatemalan officials expect some rebound of cotton exports, perhaps to an annual level of 50,000 tons. Cotton is grown primarily on the southwestern coastal plain.

Fruit and Vegetables

The horticultural subsector has expanded into a diversified line of products for the U.S. and European markets. Fruit and vegetable exports are at a much higher level during the northern temperate zone winter and spring than during other portions of the year. Currently, the most successful export commodities of the Guatemalan horticultural subsector are broccoli, melons, brussels sprouts, asparagus, berries, citrus fruits, strawberries, snow peas, and

tropical fruit. Large independent producers and cooperatives of smaller producers are the main exporters. Although the rapid growth of Guatemalan horticultural exports suggests that northern temperate zone markets are not yet approaching saturation, there is intense competition for shares of these markets. Steps to reduce export transport costs might act to raise Guatemalan export volumes, and exporters could probably also increase their market shares by improving quality control through improvements in packaging and more expeditious marketing and shipping.

Flowers and Plants

Less than 10 years ago, the value of Guatemalan exports of flowers and plants exceeded the combined value of vegetable, fruit, and legume exports; since that time, however, the export values of flowers and plants have grown only slightly while the export values of fruit and vegetables have soared. In 1989, the estimated value of flower and plant exports was equivalent to just one-third of the estimated combined value of fruit and vegetable exports. This near-to-stagnation situation for flower and plant exports may be due largely to missed opportunities: there is evidence of unsatisfactory packaging, and repeated failures to make satisfactory shipping arrangements have reduced Guatemalan export flower quality, or at least made flower exports of uncertain quality. These shortcomings, in turn, have limited the growth of Guatemalan flower exports.

Wood and Furniture

Historically, Guatemala and Honduras have been known for their extensive forests of mahogany and other heavy woods, which were exported as timber, lumber, and other wood products. Today, imports of mahogany-printed, plastic-faced formica desks and other such products dominate the domestic furniture market. Guatemala expanded its exports of wood products until, in 1989, an estimated decline occurred (see Table 6). Further decline is likely in the short term because the forest resources of the western hills are undergoing rapid depletion. El Petèn still has substantial forest resources, and logging activities are extending into El Petèn; it is highly desirable that sustainable cutting rates be identified and adhered to, and that this be done as soon as possible to ensure that the last heavily forested areas of Guatemala are not also depleted for short- to medium-term gains.

Cardamom

Guatemala is the second largest producer of cardamom in the world, after India, and all production is exported, primarily to India and other South Asian countries. As shown in Table 6, Guatemalan exports of cardamom varied during the 1980s, from about 30 to 60 million quetzales in value per year; the level for any one year depends mainly on the level of cardamom production in India in that year and the preceding year. Guatemala's

cardamom is grown mainly along the south (Pacific) coast and also in the coffee region of the western hills and mountains.

Clothing and Shoes

As shown in Table 6, beginning in 1984 and continuing through the end of the 1980s, Guatemalan clothing exports, which include the sale of shoes to the United States, grew rapidly. Many of these exports are, in fact, reexports, with cut cloth or leather being shipped to Guatemala for assembly into clothes and shoes. Much of this assembly is done in the free trade zone (ZOLIC) on the Guatemalan Caribbean coast.

Export Sector Organization

For Guatemala to be successful in the highly competitive, high-value commodity export markets it has entered, some organization of the export sector is required to better ensure that the sector is not at a disadvantage vis-a-vis the export sectors of competitor countries in terms of transportation and marketing arrangements. The export sector of Guatemala has made some progress in organizing itself, yet is less advanced in this respect than such key competitor nations as Colombia and Costa Rica. Two Guatemalan export organizations are working to improve this situation:

- The Association of Users of International Transport (CUTRIGUA). This association represents an attempt by exporters to coalesce in order to obtain adequate shipping services and favorable shipping rates. CUTRIGUA is currently attempting to attract liner shipping services to Puerto Quetzal to permit regular, direct shipment of Guatemalan exports to North American west coast ports. (In the view of GTTIS, the lack of such services at Puerto Quetzal probably largely accounts for Guatemalan west coast coffee production being shipped mostly through Caribbean ports.) CUTRIGUA is also entering into time-volume ocean shipping contracts, which offer significantly reduced shipping rates for guaranteed volumes of export shipments within specified time frames. When an export sector can enter into such arrangements and successfully ensure that specified volumes are ready for shipment within specified times, it is a clear indication that the sector has matured and largely controls its own destiny.

- The Guild (Gremial) of Exporters of Non-Traditional Products (GREXPO). The membership of GREXPO

includes manufacturers, producers, and exporters of nontraditional agricultural exports, such as flowers, fruits, vegetables, and fishery products. GREXPO provides training for its members in marketing, accounting, product packaging, and product distribution. It also serves as a clearinghouse for information of use to potential exporters, including information on new markets; market size, composition, and competition; and guidelines for market entry. GREXPO also provides direct assistance to potential exporters in establishing relationships with buyers and distributors in emerging markets. (Although GREXPO represents an effective measure for expanding Guatemalan nontraditional exports, GTTIS notes that, in 1990, considerable improvement is still needed in product packaging and export efficiency. As an example of a significant disadvantage of the Guatemalan export sector in comparison with Colombia and Costa Rica, the latter two have their exports to the United States inspected by U.S. Customs agents based at the port *before shipment*, which ensures that there are no delays in moving goods to consignees upon arrival at U.S. ports and airports, and no export produce is denied entry.)

Investment Climate

Guatemala has traditionally been open to foreign investment. Domestic and foreign investors receive the same treatment under the commercial code, and there are few restrictions on foreign ownership of land or assets. The notable exception to this rule is foreign ownership of land along the littoral, which is proscribed by a decree dating from the last century. Whereas there is no investment law per se in Guatemala, there is a Law of Promotion and Development of Export Activities and Drawback which applies to the textile industry, the so-called *maquila*. This law was enacted in May 1989 and affects firms in the textile and apparel industries that export 100 percent of their output to countries outside Central America. The law allows for suspension of import duties on raw materials and certain equipment, and exempts exporting firms from income tax. Foreign investors are also exempt from income tax as long as the country in which the home office is based does not provide tax credits for investments in Guatemala.

In the case of strategic national assets such as petroleum, foreign companies are not prohibited from active participation in the industry, but individual agreements have to be worked out between a prospective company and the government. The government does regulate the activities of oil

companies, and this extends to setting limits on the amount of oil a company may export. Wood and wood product companies are facing greater restrictions on exploitation of Guatemala's forests because of pressure from environmental groups, and activities of firms in the industry have therefore been somewhat curtailed in recent years.

For other, less-sensitive industries, however, where exploitation of resources does not contravene national or environmental interests, there are no laws or regulations to deter potential investors. Investment in the textile and apparel industry, for example, is actively solicited by the government through its Law of Promotion and Development of Export Activities and Drawback. The success of the law with regard to textiles and apparel has been impressive, with the number of firms rising from 15 in 1985 to 181 in 1989.

Like Guatemalan investors, foreign investors must be registered to conduct business in the country. Businesses can be established as single proprietorships, limited and simple partnerships, and corporations. Foreign corporations wishing to establish operations in Guatemala must present proof of their legal right to operate in their country of origin, as well as their articles of incorporation. In addition, they are required to have an agent who will serve as the legal representative of the corporation in all business and legal matters.

Foreign companies are required to declare their initial capital investment with the Exchange Department of the Bank of Guatemala. The investment is registered once the department is satisfied that the investment has indeed been made. If the company decides to shut down its operations in Guatemala, there is no prohibition from doing so; it is permitted to withdraw all its capital at the prevailing exchange rate. As for profits, the government allows repatriation of up to 85 percent in any given year. There is no exit tax or other penalty for repatriation. However, foreign corporations that leave Guatemala must ensure that all their contractual obligations have been fulfilled and must present to the appropriate authorities an audited balance sheet and income statement.

Guatemala's low wage rates and proximity to the U.S. market make it particularly attractive for U.S. investors. Investors from the United States can also take advantage of the preferential treatment certain Guatemalan exports receive under the Caribbean Basin Initiative. The duty-free entry into the United States of certain textiles and apparel assembled in Guatemala make it an attractive assembly point for U.S. manufacturers. Machine-cut pants, shorts, and shirts are sent to Guatemala for sewing and returned to the United States free of import duties. The abundance of small-sized sewing factories in Guatemala makes it more cost effective for U.S. clothing companies, such as Levis and Ocean Pacific, to set up assembly relationships rather than establishing their own plants there. In any event, the usual risks associated with foreign investment are reduced for U.S. investors who benefit

from an agreement signed between the two governments in 1960 which covers them against the risk of expropriation or inconvertibility of capital.

There appear to be no serious policy constraints to investment. Small investors can usually get started in a light manufacturing export business in about 6 months. The costs for registration and acquisition of the necessary permits are only around 500 quetzales, according to an exporter of handicrafts in Chichicastenango. But while there are no legal restrictions to discourage potential investors, there are regulations that impede the free flow of trade. Exporting firms must acquire a number of licenses and permits, many of which could be done away with. The need to buy an export permit for every shipment certainly slows the process of trade and increases exporter costs. This requirement most likely has its roots in the government's need to control the flow of foreign exchange. If the government were to commit to a freely floating currency, this requirement could be eliminated. As it is, the requirement does not deter exporters, but its elimination would most certainly increase the efficiency of the export process by reducing export transaction costs.

The requirement that exporters surrender 100 percent of their foreign exchange earnings is not an obstacle for firms that do not use imported raw materials. Exporters of *shate* (an ornamental plant) and handicrafts, for example, do not need to import any raw materials, so for them the 100 percent surrender requirement is of no significance. For firms that do need to import raw materials, however, the need to surrender export earnings one month and then purchase foreign exchange the next is a needless additional cost; this cost has been particularly high in the last year because the value of the quetzal has been falling.

Foreign investment throughout Latin America was relatively low in the 1980s. This was a function of restrictive policies in some countries and political instability in others, particularly those in Central America. In Guatemala, whereas the foreign exchange surrender requirement and the need to acquire export licenses for each shipment certainly constitute obstacles for exporters, it is the general impression of GTTIS that they have not been responsible for keeping away foreign investors. Those foreign investors that have steered clear of Guatemala, have likely done so because of the generally negative perceptions of the Central American region. Some semblance of political stability returned to Guatemala with the democratically installed government in 1986. Nevertheless, there is still the perception of instability in regions outside the capital. Sporadic guerilla activity in those regions only strengthens these perceptions, which, in some instances, have been responsible for keeping potential U.S. buyers of apparel away from the Quezaltenango region. The head of the GREXPO in Quezaltenango indicated that some U.S. businessmen who come to Guatemala to establish apparel assembly relationships with local firms stay away from Quezaltenango because of travel advisories issued by the U.S. embassy and the perception of the region as a dangerous area.

Chapter 3

TRANSPORTATION SECTOR OVERVIEW

Transport System

The Guatemalan transport system comprises the four transport modes of road, rail, sea, and air transport. Facilities include

- A national road network of approximately 11,000 kilometers of primary and secondary roads.
- Approximately 3,000 kilometers of tertiary roads.
- A narrow-gauge (3-foot) railway, with a 600-kilometer main line running from the Mexican border, through Guatemala City, to the Caribbean ports, and 200 kilometers of branch lines providing connections to the Pacific ports and to the Salvadoran border.
- Caribbean seaports of Santo Tomas de Castilla and Puerto Barrios.
- Pacific seaports of Quetzal, San Jose, and Champerico.
- The international airport of La Aurora at Guatemala City.
- Two airports (currently used primarily for military purposes) near the Caribbean ports and near the Pacific port of San Jose.
- Smaller civilian airports including Santa Elena at Flores in El Petén, and airports at Esquipulas (near border with Honduras), Retalhuleu (in the far

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southwest), Huehuetenango (in the northwest), and Coban (in the middle north).

- About 600 airstrips.

Transport Services

Road transport services are provided entirely by the private sector. The trucking industry is comprised of two distinct groups of operators:

- Individual owner-operators, employing mainly rigid trucks, typically two-axled with a load capacity of 10 tons, and serving mainly to accommodate agricultural commodities and back-haul general cargo.

- Larger, organized operators, employing mainly articulated trucks, typically with a load capacity of 20 tons, and serving mainly to accommodate containers, break-bulk consignments of finished goods, and commodities hauled in bulk.

The World Bank estimated, in 1988, that the larger, organized operators were achieving an average 70 percent load factor, and the individual owner-operators were achieving about a 60 percent average load factor. These load factors appear to indicate acceptable levels of operating efficiency, except that the high load factor for articulated vehicles might include significant haulage of empty containers. The national fleets of rigid and articulated trucks, in 1986, were 39,000 and 6,900 units respectively; these totals include trucks used for own-account transport, as well as trucks employed by the trucking industry. In the view of the World Bank "the trucking industry is well developed, competitive, and truck rates are in line with other Latin American countries."

Pick-up trucks, of which there are considerable numbers in Guatemala, are employed for both small-consignment freight service and short-distance passenger services. Longer-distance passenger services are performed by buses.

The railway performs both freight and passenger services, most or all of which are domestic services. Freight services include mainly the haulage of export bananas to Caribbean ports. Passenger services accommodate an average trip length of 80 kilometers.

Cargo and passenger shipping services are provided at the principal Caribbean port of Santo Tomas, with cargo services representing 93 percent of service value. Roughly 80 percent of cargo services are provided by the members of a shipping conference, the Central American Liner Association (CALA); membership includes CCT, Sea-land Services, and Seaboard Marine. Shipping services at Quetzal, the principal Pacific port, are provided mainly by nonconference liner operators. Trampers also serve Santo Tomas and Quetzal and provide the only nonpetroleum shipping services available at the secondary ports of San Jose, Champerico, and Puerto Barrios.

Guatemala's flag airline, AVIATECA, provides scheduled international passenger and cargo services, including full-cargo services, and also provides chartered domestic passenger services. Besides AVIATECA, five other airlines currently provide full-cargo international air services, and several international airlines offer both passenger and cargo services, employing passenger aircraft. These international airlines include Pan Am, American (taking over, in 1990, services formerly offered by Eastern Airlines), TACA (the El Salvador flag airline), Mexicana, KLM, Iberia, SAHSA, COPA, LACSA, and SAM. Domestic services are provided by three Guatemalan private airlines, in addition to some AVIATECA charter services, namely Aeroquetzal, Aerovias, and Tapsa. Aeroquetzal also operates a short international route between Flores, El Petén and Cancun, Mexico.

Transport System Management Regulation

The Ministry of Communications, Transport and Public Works (MCTOP) has long been responsible for Guatemala's road network and public airports, but prior to 1987, it had no responsibility for overseeing the development and operation of Guatemala's railway system, seaports, or air transport services. In 1987, the government undertook a series of reforms to strengthen the role of MCTOP in transport sector management. The MCTOP now, directly or indirectly, oversees all public sector transport modes and organizations, with the exception of the port of Santo Tomas de Castilla. The MCTOP subordinate transport organizations (government general directorates and parastatal enterprises) are

- General Directorate of Roads (DGC)—responsible for development and maintenance of the Guatemalan road network.
- General Directorate of Transport (DGT)—responsible for regulation of the road passenger transport industry (existing law would permit the MCTOP, through the DGT, to regulate the trucking industry

also, but the MCTOP has not been inclined to institute any such regulation).

- General Directorate of Civil Aeronautics (DGAC)—responsible for developing, operating, and maintaining six civilian airports in Guatemala, and for ensuring traffic safety and providing flight information for Guatemala's airspace.

- Guatemalan Railway Company (FEGUA)—responsible not only for the railway system, but also for the ports of San Jose, Puerto Barrios, and Champerico. Before 1987, Champerico was an autonomous public sector/private sector joint venture, reporting to the government through the Ministry of Finance. FEGUA itself, until 1987, reported to the Ministry of Economy.

- Port of Quetzal Authority—responsible for development of the new port of Quetzal (which opened to traffic only in 1983), and for port management and operations. Prior to 1987, the organization reported directly to the President of the Republic.

- AVIATECA—provides air transport services (see preceding section). Prior to 1987, the airline reported to the Ministry of Economy.

There remains one major transportation facility for which the MCTOP has no oversight responsibility, and this is the Caribbean port of Santa Tomas de Castilla. The Port Authority of Santo Tomas de Castilla (EPNSTC) remains semiautonomous, reporting only to the Ministry of Finance.

Role of Transportation in the Guatemalan Economy

Over the past 20 years, transportation has contributed between 5.3 and 5.8 percent of Guatemala's GDP. Between 1970 and 1980, both Guatemala's GDP and the contribution of the transport sector grew rapidly, the GDP by 73.3 percent in real terms and the contribution of the transport sector by 84.5 percent. The transport sector contribution increased as a proportion of the GDP from 5.3 percent in 1970 to 5.8 percent in 1980. During the 1980s, the Guatemalan economy stagnated, and the transport sector contribution to GDP declined to 5.6 percent in 1989; whereas the economy grew by 5.8 percent over the 9-year period from 1980 to 1989, the transport sector grew by only a minuscule 1.6 percent.

Table 7 indicates the contribution to GDP of the transport sector and its subsectors, in constant 1958 quetzales, over the 1970-89 period. As shown in the table, all transport subsectors contributed to the rapid growth of the overall sector during the 1970s, but with sea cargo and international air transport services growing especially rapidly, by 252 percent and 124 percent, respectively. During the 1980s, these two sectors continued to grow, but at significantly slower rates; over the 9-year, 1980-89 period, growth was 26.5 percent for sea cargo and 19.2 percent for international air services. Urban transport services expanded even more rapidly during 1980-89, growing by 42 percent. Otherwise, the 1980s saw absolute declines in intercity land transport services and domestic air transport, and international sea passenger services grew only very slightly.

Table 8 indicates the relative importance of road, sea, and air transport for movement of Guatemalan exports to foreign destinations. Proportionally, road transport was only about one-half as important for international movement of exports in 1989 as it was in 1980, and the mode also declined in importance in absolute terms. The importance of both sea and air transport, conversely, increased during the 1980s. As might be expected, the average values of commodities moved by sea are generally lower than those moved by road, except for exports transported by sea in 1980 and 1985. In 1989, the average value of exports moved by road was 75 percent above the value of exports moved by sea. The average values of air cargo are appreciably higher than average values of export cargoes moved by the other two modes; in 1989, exports going by air were, on the average, 70 percent higher in value than exports moving by road, and were nearly three times the value of exports moving by sea. These value differentials in favor of air cargo were lower, in fact, than in most years preceding 1989; in both years that shipment by air surged (that is, 1985 as well as 1989), the average value of air cargo dropped sharply from the preceding years. This seems to suggest that there is a significant segment of export production which is marginal with regard to use of air transport.

Transport Planning

As indicated earlier in this chapter, before 1987 the MCTOP's responsibility was largely limited to roads and road transport services. In 1987, however, it was given oversight responsibility, as well, for the railway system, four of Guatemala's five ports (excepting only Santo Tomas de Castilla), and air transport services. The MCTOP's new responsibilities include planning for the entire transport sector, yet the MCTOP currently has only limited planning capability. Therefore, the World Bank has included, under its ongoing Secondary and Regional Road Rehabilitation Project in Guatemala, a component to produce a national transport plan, with technical assistance to the MCTOP to complete this undertaking and, in the process, to

Table 7. Participation of Transport Sector in Formation of GDP at Market Prices (thousands of 1958 Quetzales)

	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
GDP	1,792,754	2,352,750	3,106,877	3,127,560	3,016,573	2,939,604	2,953,546	2,936,062	2,940,175	3,044,395	3,162,867	3,288,110
Total transport	95,708	138,004	181,326	176,519	164,462	159,484	162,122	162,041	161,863	170,247	174,838	184,317
Road transport	79,483	107,415	143,118	140,063	131,326	129,004	130,813	130,556	128,884	133,231	136,816	142,347
Urban	6,657	8,929	11,624	11,254	11,604	11,974	12,298	12,372	13,198	13,996	15,155	16,504
Buses	4,481	5,831	7,660	7,353	7,323	7,167	7,247	7,255	7,851	8,279	9,285	10,126
Taxis [a]	2,176	3,098	3,964	3,902	4,281	4,806	5,051	5,117	5,348	5,717	5,870	6,379
Other	72,825	98,487	131,494	128,809	119,722	117,030	118,515	118,184	115,686	119,235	121,661	125,843
Passenger	13,250	20,159	30,577	31,424	28,375	29,794	30,580	30,689	31,516	32,367	33,142	34,403
Cargo	59,575	78,328	100,917	97,385	91,347	87,237	87,934	87,495	84,170	86,868	88,519	91,440
Rail transport	4,632	5,629	5,866	5,099	5,585	4,058	3,361	3,486	3,909	4,019	2,611	3,041
Air transport	4,155	7,028	8,949	8,195	6,861	6,174	6,190	5,913	5,629	7,095	8,048	9,791
Domestic	563	636	916	785	584	195	207	176	174	178	208	219
International	3,592	6,391	8,032	7,409	6,277	5,979	5,983	5,738	5,456	6,917	7,839	9,572
Ocean transport	7,031	17,261	22,430	22,329	20,014	19,549	21,048	21,462	22,721	25,057	26,355	27,947
Passenger	1,137	1,891	1,667	1,714	1,762	1,811	1,842	1,720	1,699	1,765	1,711	1,683
Cargo	5,894	15,370	20,763	20,615	18,252	17,738	19,206	19,743	21,022	23,292	24,644	26,264
Travel agencies	408	671	963	834	676	700	711	624	719	845	1,008	1,1927

[a] From 1980 this item includes the activity of microbuses.
Source: Central Bank of Guatemala

Table 8. Guatemalan Exportation, By Transport Mode, 1980-1989

Year	Export Volume[a]								Export Value[b]							
	Metric tons (000)				Percent of total				US$ (millions)				Percent of total			
	Road	Sea	Air	Total	Road	Sea	Air	Total	Road	Sea	Air	Total	Road	Sea	Air	Total
1980	634	1237	11	1887	33.9	65.5	0.6	100.0	412	1008	53	1473	28.0	68.4	3.6	100.0
1981	559	1200	8	1767	31.6	67.4	0.5	100.0	407	665	37	1109	36.7	60.0	3.3	100.0
1982	520	1272	9	1801	28.9	70.6	0.5	100.0	360	686	38	1084	33.2	63.3	3.5	100.0
1983	411	1498	9	1918	21.4	78.1	0.5	100.0	327	751	40	1118	29.2	67.2	3.6	100.0
1984	413	1168	12	1593	25.9	73.3	0.8	100.0	243	754	48	1095	26.8	68.8	4.4	100.0
1985	404	1258	30	1692	23.4	74.3	1.8	100.0	217	734	41	992	21.9	74.0	4.1	100.0
1986	318	1547	11	1876	17.0	82.4	0.6	100.0	198	828	44	1070	18.5	77.4	4.1	100.0
1987	390	1506	17	1913	20.4	78.7	0.9	100.0	248	695	44	987	25.1	70.4	4.5	100.0
1988	421	1538	19	1978	21.3	77.7	1.0	100.0	258	714	50	1022	25.2	69.9	4.9	100.0
1989[c]	265	1384	30	1684	15.7	82.5	1.8	100.0	203	609	39	851	23.8	71.6	4.6	100.0

[a]Original data were in terms of revenue tons, which are metric tons for some commodities and cubic meters for others. Conversion factor for adjusting revenue tons to metric tons was estimated to be 0.9072, and was employed to derive the metric tonnage figures of this table.
[b]Value represents f.o.b. value. Conversions from quetzales were made with an exchange rate of Q1=$1 prior to 1987, and $1=Q2.50 in 1987, Q2.60 in 1988, and Q2.85 in 1989.
[c]Data are for first 9 months only.
Sources: National Institute of Statistics (INE) for 1980-85 data, and Central Bank of Guatemala for 1986-89 data.

train MCTOP planning staff. In addition to this training, the national transport planning effort, to begin in 1991, will include the following tasks:

- Installation at the MCTOP of a consistent transport sector database, including demand patterns, supply characteristics, operations, tariffs, and user charges.
- Development of an analytical framework capable of projecting transport demand and allocating it on a spacially disaggregated basis to alternative transport modes, as a function of their relative attributes to users.
- Generation and economic evaluation of alternative investment strategies, including environmental assessment.
- Elaboration of a pluriannual sector expenditure and funding program, taking into account economic priorities, and the program's foreseeable impact in terms of foreign exchange earnings/savings, and fiscal implications.
- Diagnosis and recommendations on required measures for an improved government role in the transport sector, and on associated institutional development measures.

Chapter 4

SURFACE TRANSPORTATION

Road Network

The road network of Guatemala consists of a few highways constructed to high design standards and a large number of roads constructed to lower design standards. Most of the latter are unpaved, and many have low design speeds resulting from high curvature in hilly and mountainous areas, and are often impassable during periods of heavy rain. Paved road length, in fact, declined somewhat in absolute terms from the 1980 to 1983 period to the late 1980s, and, proportionally, paved roadway has declined significantly, over the same period, from more than 30 percent of the network to less than one-fourth of the network. This trend to lower surface standards is shown in Table 9.

The three principal highways of Guatemala are:

- The Guatemalan portion of the Pan American Highway, which the DGC identifies as being 519 kilometers in length, consisting of a 344-kilometer western section linking Guatemala City to the Mexican border at La Mesilla, and a 175-kilometer eastern section linking Guatemala City to the Salvadoran border at San Cristobal. In 1987, the annual average daily traffic (AADT) on the western section was approximately 1,150 vehicles, and on the shorter, eastern section around 1,840 vehicles.

- The Pacific Highway of 350 kilometers lying in the Pacific coastal plains. This highway comprises a western section of 240 kilometers, linking Escuintla to the Mexican border at El Carmen, and an eastern section of 110 kilometers, connecting Escuintla to the Salvadoran border at Ciudad Pedro de Alvarado.

Table 9. Guatemalan Road Network

Year	Road Network Length (kilometers)			Percentage of Network		
	Paved Surface	Unpaved Surface	Total	Paved Surface	Unpaved Surface	Total
1980	3,184	7,057	10,246	31.1	68.9	100.0
1981	3,220	7,304	10,524	30.6	69.4	100.0
1982	3,304	7,425	10,729	30.8	69.2	100.0
1983	3,324	7,594	10,923	30.5	69.5	100.0
1984	3,041	7,604	10,645	28.6	71.4	100.0
1985	3,099	8,291	11,390	27.2	72.8	100.0
1986	2,977	8,687	11,664	25.5	74.5	100.0
1987	3,043	9,393	12,436	24.5	75.5	100.0
1988	3,063	9,622	12,685	24.1	75.9	100.0

Note: Excludes approximately 1,100 kilometers of local roads constructed under USAID-financed community development programs.
Source: Direccion General de Caminos.

The western section closely parallels the main line of the railway, which then proceeds northward through Escuintla to Guatemala City and the Caribbean coast. Except around Escuintla, where AADT climbs to several thousand vehicles, AADT levels on the Pacific Highway are generally below 1,000 vehicles.

- The 437-kilometer Inter-Ocean Highway, connecting the Caribbean and Pacific ports of Guatemala and passing through Guatemala City and Escuintla. The 125-kilometer southern section, linking the ports of Quetzal and San Jose to Guatemala City, had an AADT of around 2,500 vehicles in 1987, and the 312-kilometer northern section, from Guatemala City to the Caribbean ports, had a 1987 AADT of around 1,600 vehicles. The Inter-Ocean Highway parallels the railway for nearly its entire length (mostly paralleling the railway's main line, but paralleling a branch line from the port of San Jose to a junction with the main line south of Escuintla). In recent years the Inter-Ocean Highway has been undergoing realignment, rehabilitation, and upgrading, and upon project completion, port access will be greatly improved in comparison to past years. The portion that is being realigned, between Escuintla and Puerto Quetzal, is nearly complete except for several bridges that have yet to be constructed. (This highway improvement raises a question of the future viability of the railway, as discussed below.)

In addition to the approximately 1,300 kilometers of paved road that comprise these three principal highways of Guatemala, the network of national and international (Central American) roads includes about another 2,500 kilometers of road (Figure 3). Although approximately three-fourths of this network is paved, only a small portion of the network is classified as being in good condition. As estimated by DGC, roughly 56 percent of Guatemalan paved roads are currently in fair to good condition, and the remaining 44 percent of paved roads are in poor to bad condition. Ongoing projects being financed by the InterAmerican Development Bank (IDB) and by the World Bank will result in increasing the proportions of the national and Central American road network that are in fair to good condition.

Guatemala is divided politically into 23 departments, and departmental roads constitute more than one-half of the entire road network. Most of these roads are unpaved and in fair to poor condition. There are also many rural roads, some of which are under DGC jurisdiction and a sizeable

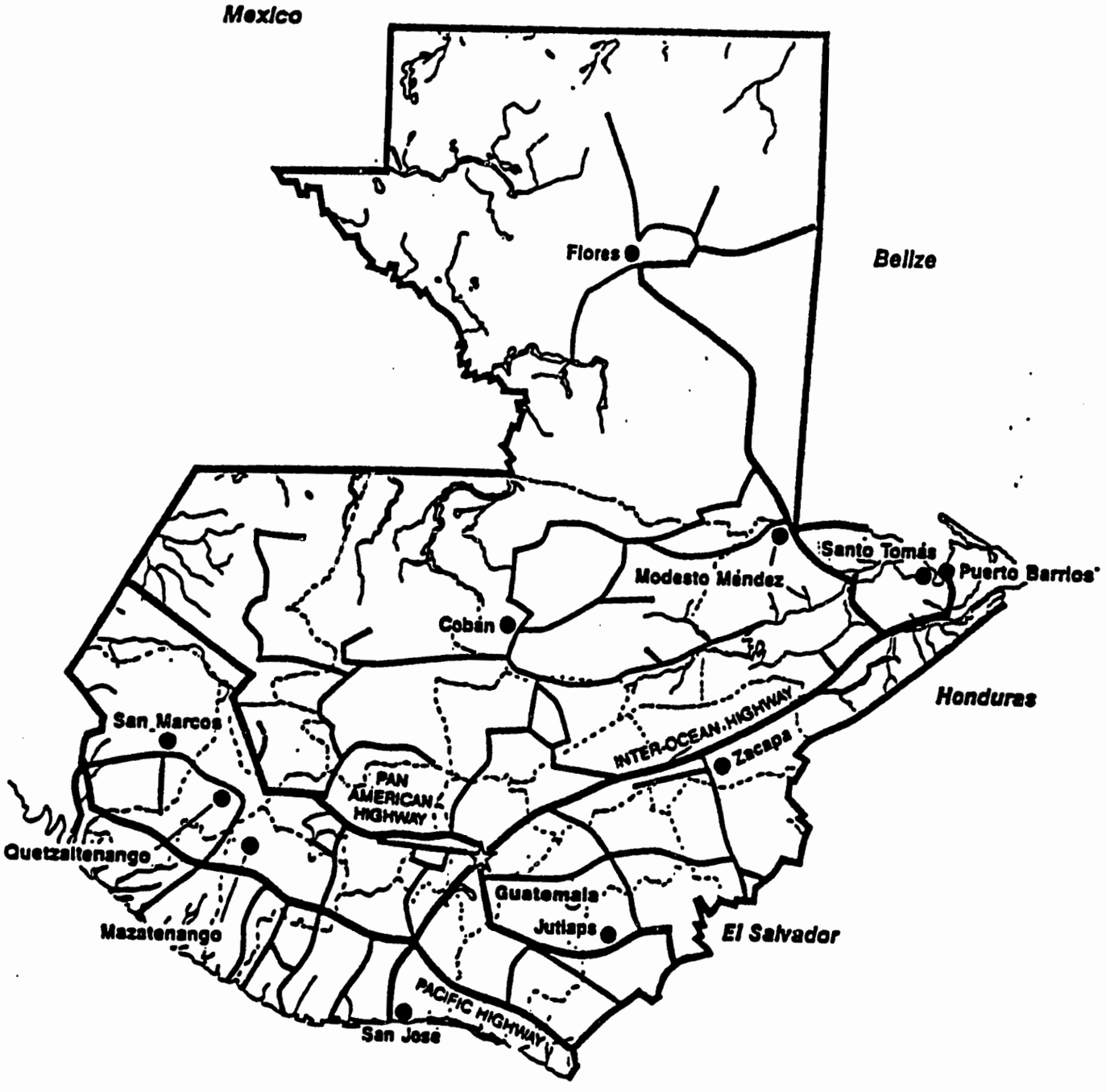


Figure 3. Guatemala Highways

number of which are under the jurisdiction of local communities. The combined length, in 1990, is between 3,000 and 4,000 kilometers.

In the view of GTTIS, the national and Central American road network is sufficiently elaborate (at about 3,800 kilometers) for the near to medium term. Provision of any new links in the network, such as might eventually be constructed in the northern departments of El Petén, Alta Verapaz, Quiche, and Huehuetenango, might desirably be deferred for some period of years. In the interim, emphasis with regard to this portion of the overall road network should be placed on rehabilitation and on the improvement of DGC maintenance programming and implementation capability. Where departmental and, especially, rural roads are concerned, however, some new construction and appreciable upgrading are in order, in addition to improved road maintenance.

Table 10 indicates how road expenditure was divided among classifications of Guatemalan roads and among types of project in 1 year (1988); the sizeable portion of the total that was allotted to Central American road reconstruction represents the major ongoing project to improve the Inter-Ocean Highway. In the view of GTTIS, the new construction and reconstruction expenditure categories, representing a combined 74 percent of the total in Table 10, should be allocated much lower shares of total road expenditure in future years. It is believed (but GTTIS was not able to obtain the data) that total road expenditure jumped appreciably in 1989, as compared with 1988, mainly as a result of the commencement of a World Bank-financed roads project (the Bank project document projected Guatemalan road expenditure to average 131 million quetzales per annum over the 1989-1991 period).

Road Transport

Guatemala has a well-developed road transport industry. Road freight transport costs are held as low as they might be (considering current unit costs for vehicles and fuel and the current state of the roads) by a competitive trucking industry operating large, generally well-maintained vehicles, with well-trained drivers. Truckers operating in rural areas, however, generally place less emphasis than the intercity trucking firms on vehicle maintenance and driver experience. Despite the general adequacy of the trucking industry, there appears to be some need to provide more refrigerated trucking capacity, as insufficiency of such capacity could hinder the growth of perishable, nontraditional, agricultural exports.

In a case identified by GTTIS, for example, where strawberry producers of the Quezaltenango region were shipping their produce to La Aurora Airport, the 4-hour trip along tortuous roads in poor condition caused significant deterioration of the strawberries; the immediate result of this

Table 10. Guatemalan Road Expenditure, 1988

Type of expenditure	Expenditures (millions of quetzales)					Percentage of total road expenditure
	Central American roads	National roads	Departmental roads	Rural roads	Total network	
New construction	2.9	4.1	13.6	15.7	36.3	54.3
Upgrading/extension	3.0	–	–	–	3.0	4.5
Reconstruction	13.0	–	–	–	13.0	19.5
Rehabilitation	6.0	–	–	0.5	6.5	9.7
Maintenance (normal)	0.2	0.2	0.4	2.4	3.2	4.8
Other	0.8	1.1	2.9	–	4.8	7.2
Total	25.9	5.4	16.9	18.6	66.8	100.0
Percentage of total	38.8	8.1	25.3	27.8	100.0	—

Note: Thirty-one percent of total road expenditure was financed with domestic resources; of the 69 percent financed through foreign assistance, approximately one-fourth represented grant aid. Most (77.6 percent) grant aid was for new construction of rural roads.

deterioration was the need to sell the strawberries on the local market rather than export them, and the longer-term effect has been that strawberry exports from the Quezaltenango region have practically ceased. The use of appropriate, refrigerated trucking capacity for this traffic would have largely eliminated damage and deterioration en route and maintained the export market. The problem could, alternatively, be largely eliminated by improving the road, thereby reducing transit time to around 3 hours (for a trip of slightly over 200 kilometers).

About the longest export shipment distances in Guatemala are between the department of El Petén and Guatemala's seaports; Flores, the capital city of the department, is approximately 600 kilometers from Puerto Quetzal on the Pacific coast and 290 kilometers from the Caribbean ports. Transit times for shipments from Flores to the Caribbean port of Santo Tomas are around 20 hours, meaning that trucks' average travel speed is slightly under 15 kilometers per hour, and average running speed (eliminating all stopped time from the calculation) is estimated at 15 to 20 kilometers per hour. Despite this long travel time, exporters of wood and ornamental plants in El Petén indicate the trucking services are adequate and trucking costs are reasonable because of the large number of truckers and their competitiveness.

Whereas the poor condition of the road network may not have direct, serious adverse effects on the growth of exports and investment—because of the competitiveness of the trucking industry and the relatively short distances of shipments to Guatemala's seaports and international airport—GTTIS obtained some evidence that overly long transit times and difficult passenger travel conditions may, indirectly, be adversely affecting investment and export growth. In one instance, it was learned that textile buyers from the United States tend to avoid the Quezaltenango region (which is a center of textile production as it is located near the cotton-growing area) because of the time it takes (4 hours) to travel there. Similarly, prospective investors at the export processing zone and elsewhere in the Santo Tomas area are daunted by the 5-hour trip to and from the international airport. In both of these cases road improvements could improve the market/investment situation, and between Santo Tomas and La Aurora, at least, road improvement is under way; improved air services might be even more effective in eliminating the travel constraints of prospective foreign buyers and investors, as discussed in Chapter 6.

Railway Transport

FEGUA was established in 1968, evolving from a private international railway that had been serving the Mexico-Central American area. Connections to the Mexican railway system (at Ciudad Tecum Uman) and to the Salvadoran railway remain in place, but FEGUA is no longer of significance for international passenger and goods movements. For the most part, the

FEGUA system is single track, with about 800 route kilometers and 948 track kilometers, all narrow gauge (Figure 4). In 1990, because of track deterioration and falling traffic volumes, only 636 kilometers of track (approximately two-thirds of the system) are considered by FEGUA as operational. The narrow gauge, poor alignment in some areas, poor track condition generally, and some steep grades conspire to severely restrict running speeds, and average speed on the system is now only around 30 kilometers per hour. Despite these slow running speeds, derailments continue to occur. Table 11 indicates freight traffic loaded by railway section. About 90 percent of the freight loaded on the Puerto Barrios-Bananera section is bananas for export through Puerto Barrios or the port of Santo Tomas. The freight loaded at Guatemala City and between Guatemala City and Tecum Uman comprises primarily imports and exports using the ports of San Jose and Quetzal. Commodities are identified in Table 12.

The major project to reconstruct the Inter-Ocean Highway (discussed in an earlier section of this chapter) has created considerable inconvenience for road traffic, affecting, especially, sizable proportions of cargo volumes at Guatemala's major ports. Therefore, the Guatemalan government decided, in 1985, to induce as much traffic conversion from road to rail as possible, thereby reducing traveler and shipper inconvenience and cost. To accomplish this, railway freight and passenger tariffs were set at 60 percent of the levels of competing road transport services. The strategy worked, as can be seen from Table 13, which shows that there was a significant rebound in freight volumes hauled by the railway during 1985-1987, as compared with 1983-1984. In 1988, however, with much of the work on the Inter-Ocean Highway completed, railway freight volumes declined sharply. GTTIS was unable to obtain 1989 railway freight traffic data, but the continuing work to improve the Inter-Ocean Highway, and particularly the completion of bridge construction between Escuintla and Puerto Quetzal, is likely to result in a further shift of freight volumes from the railway to the road.

Although the government strategy of offering below-cost rail tariffs to convert road users to use of railway services successfully converted some traffic, the financial results to FEGUA were disastrous, as large deficits occurred (estimated by the World Bank as equivalent to nearly U.S. $2 million in 1986). Losses on this order, suffered by a railway already in poor financial health—and with severely deteriorated track, communications, signaling and rolling stock—raise questions as to the ultimate survival of the railway.

FEGUA has been planning and working for its survival. In 1987, FEGUA launched an ambitious program to develop a more cost-effective and competitive operation. The program entails some reorganization and reductions in the labor force from approximately 1,600 employees, currently, to fewer than 1,000. A new sales and marketing group at FEGUA is developing a strategy to improve the railway's competitiveness with road transport, particularly for major import and export commodities such as sugar, coffee, and wheat.

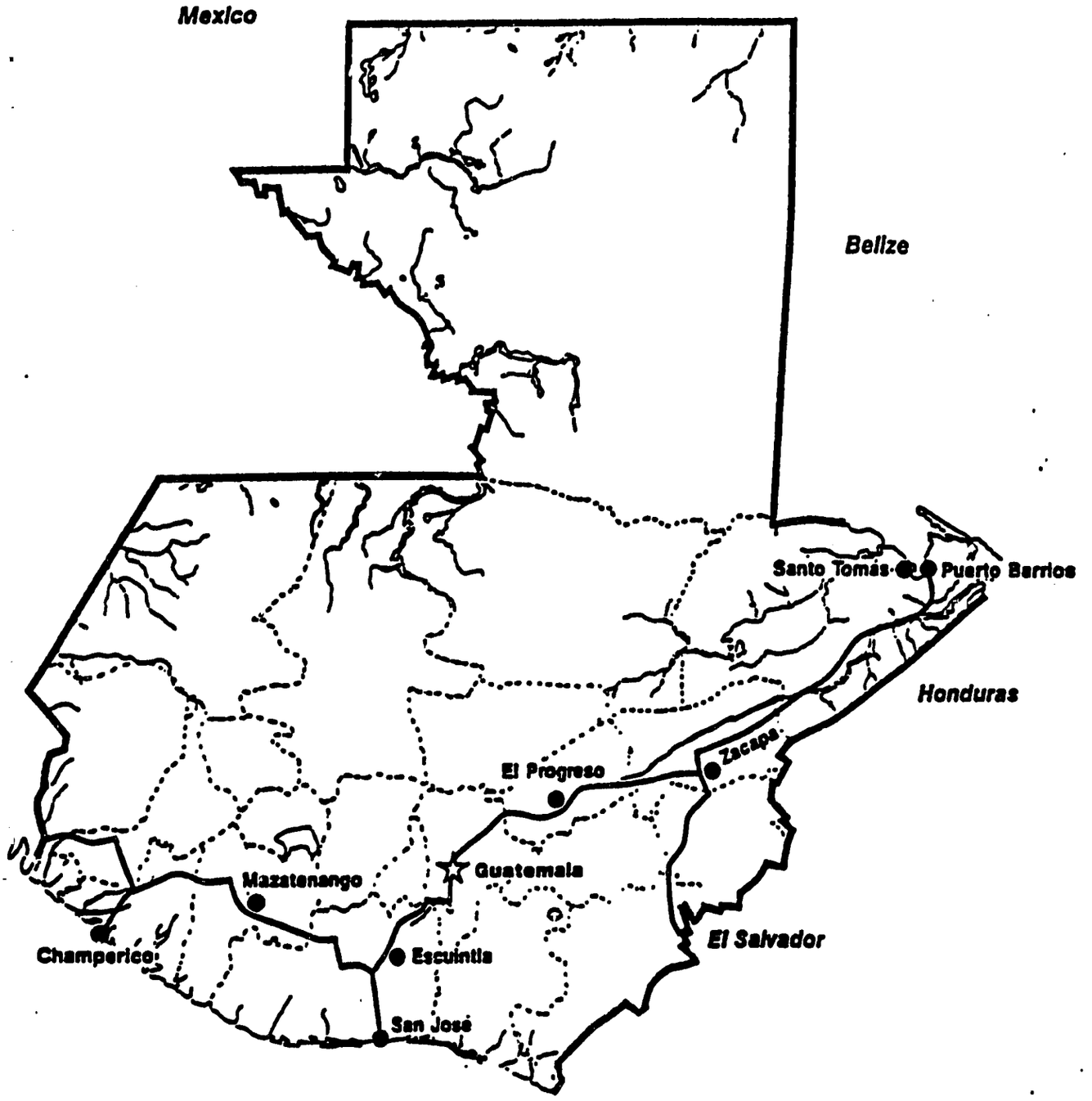


Figure 4. Guatemala Railraods

Table 11. Freight Loaded by Railway Section, 1987

Route	Tons (000s)	Percent of Total
Puerto Barrios—Bananera	292	50.2
Bananera—Zacapa	11	1.9
Zacapa—El Rancho	1	.2
El Rancho—Guatemala	16	2.7
Guatemala—Escuintla	128	22.0
Escuintla—Mazatenango	73	12.5
Mazatenango—Tecum Uman	61	10.5
Total	582	100.0

Source: MCTOP 1987, Comision de Estadistica del Transport.

Table 12. Commodities Transported by Railway, 1987

Commodities	Tons (000s)	Percent of Total
Exports		
Sugar	79.8	12.3
Coffee	34.7	5.3
Bananas	271.7	41.7
Molasses	2.4	0.4
Other exports	2.8	0.4
Subtotal	391.5	60.1
Imports		
Wheat	41.6	6.4
Petroleum	13.7	2.1
Other imports	85.0	13.1
Subtotal	140.3	21.6
Domestic freight[a]	118.9	18.3
Subtotal	118.9	18.3
Total freight	650.7	100.0

[a]Domestic freight includes railway own-account (nonrevenue) freight, such as ballast, ties, and fuel. This traffic is estimated at 69,000 tons in 1987, and accounts for the difference in the total shown here and the totals for 1987 in Tables 11 and 13, which take into account only revenue freight.

Source: MCTOP 1987, Comision de Estadistica del Transport.

Table 13. Railway Freight Volumes and Seasonality, 1980-1988

(thousands of metric tons)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1980-88 average	Percentage of annual
January	53.9	55.5	42.3	62.4	27.4	29.6	60.9	59.1	46.8	48.7	9.0
February	60.6	52.7	45.6	54.0	24.1	24.4	63.7	41.4	43.9	45.6	8.4
March	61.6	56.8	53.7	44.6	36.9	52.5	55.3	57.7	37.1	50.7	9.4
April	50.9	58.7	53.9	33.9	39.3	39.1	52.7	44.9	33.5	45.2	8.4
May	52.5	47.9	58.1	39.5	33.5	47.7	55.5	65.1	54.6	50.5	9.4
June	56.2	56.3	51.5	21.9	43.2	41.1	45.1	50.8	26.0	43.6	8.1
July	56.4	47.9	41.5	25.7	38.5	51.9	50.5	44.0	32.6	43.2	8.0
August	65.8	37.0	46.7	27.3	34.0	40.7	36.2	57.8	25.0	41.2	7.6
September	65.4	50.4	42.0	35.0	26.6	46.0	32.8	46.9	35.0	42.2	7.8
October	56.8	49.6	56.0	55.7	29.8	48.0	50.9	42.6	31.7	46.8	8.7
November	55.7	46.4	47.3	51.5	32.3	37.6	44.3	39.2	31.6	42.9	8.0
December	42.3	36.5	48.8	43.1	31.0	46.2	42.3	32.1	28.1	38.9	7.2
Total	678.2	595.7	587.5	494.5	396.6	504.8	590.2	581.7	425.8	539.5	100.0
Monthly average	56.5	49.6	49.0	41.2	33.1	42.1	49.2	48.5	35.5	45.0	8.3

Source: FEGUA.

However, government investment will also be essential. No significant investment is scheduled through the end of 1991, but the government has tentatively scheduled some funding of railway system rehabilitation for later years. A final decision on the matter will follow completion of the national transport plan, work on which is scheduled to begin in early 1991.

One section of the railway, at least, is likely to survive. This is the section between Guatemala City and the smaller city of El Progreso, approximately 130 kilometers to the northeast. Guatemala's only cement plant is located at El Progreso, and a large portion (more than 1,000 tons per day) of the plant's production must be moved to a warehouse at Guatemala City. Until now all the cement has been accommodated by trucks; but a railway siding to the plant is under construction, and in September 1990 the railway is scheduled to begin transporting the portion of cement going to Guatemala City. Trucks will continue to be used for the lower-volume eastward and northward shipments from the plant, and for movements from the Guatemala City warehouse.

It is conceivable that Guatemala could usefully provide a "land bridge" between the Atlantic and Pacific Oceans, primarily for the movement of containerized freight. The railway would be essential to a Guatemalan land bridge, and the poor state of the system undoubtedly constitutes one reason why a Guatemalan route is not now actively considered. Guatemala's ports are not now adequate for such an operation either, so a Guatemalan land bridge may be only a long-term possibility.

In the view of GTTIS, the following three actions with regard to FEGUA operations and investment should be taken:

- End all subsidization of freight and passenger services.
- Bring derailments under control by imposing more severe restrictions on running speeds.
- Make no investment in the railway system until the results of the national transport plan are known (in 1993).

If railway freight and passenger services subsidies are discontinued, it is possible that no tariff levels can be found to cover all long-term marginal costs; that is, higher railway tariffs could result in significant conversion to road transport services and/or own-account road transport. Tariff levels should be adjusted, in that case, to whatever levels will minimize losses. These tariff levels are probably higher than existing tariffs, and, together with the imposition of more severe speed restrictions to eliminate derail-

ments, are likely to significantly reduce railway passenger volumes, if not freight volumes. To ensure that anticipated traffic conversion from rail is adequately accommodated on the road, the government should act to complete the overly time-consuming Inter-Ocean Highway improvement project, particularly the missing bridges in the otherwise completed new alignment between Escuintla and Puerto Quetzal.

Whereas the ending of railway service subsidization and the acceleration of work on the Inter-Ocean Highway would rationalize traffic patterns and modal choices in the short- to medium-term (and help minimize the overall costs of transport in Guatemala), it is conceivable that, in the longer-term, railway transport could play an increased role in Guatemala. For example, a Guatemalan land bridge would require an improved railway system. Other domestic possibilities for increased use of rail transport include the establishment of major industrial undertakings, similar to the El Progreso cement plant, along the railway corridor, and an increased railway role in petroleum distribution, thereby reducing the danger of disastrous petroleum product tanker accidents on the roads. Internationally, Mexico-Central American transit traffic (both passenger and freight) could conceivably be important in the future, and Guatemala City itself could generate international railway traffic. With regard to these long-term possibilities, GTTIS cannot anticipate the findings of the national transport plan.

Chapter 5

PORTS AND SHIPPING

Port System Traffic

The five ports of Guatemala were identified in Chapter 3. Puerto Santo Tomas de Castilla (Santo Tomas) is the busiest Guatemalan port, and Puerto Quetzal is of growing importance and is expected to become a major international port. Puerto San Jose is now used only for petroleum and petroleum products, and Puerto Champerico accommodates little more than declining volumes of cotton exports. Puerto Barrios accommodated sharply lower traffic volumes in the mid and late 1980s in comparison with earlier years, but there are plans to resuscitate the port, in some measure, so that increasing volumes of banana exports, at least, can be accommodated at Puerto Barrios in the future.

Table 14 identifies the vessel calls of Guatemala's five ports during the decade of the 1980s, although 1989 figures for the ports of Barrios, San Jose, and Champerico were not yet available when GTTIS was conducted in early 1990. Figure 5, which presents trends in vessel calls, clearly shows the dominance of Santo Tomas among Guatemalan ports and the trend to increasing accommodation of container traffic at the ports. The irregular record of refrigerated vessel calls at Santo Tomas may result from a vessel classification problem between this vessel category and general cargo ships; otherwise the sharp changes in the latter category from 1984 to 1985, 1985 to 1986, and 1987 to 1988 would be difficult to explain.

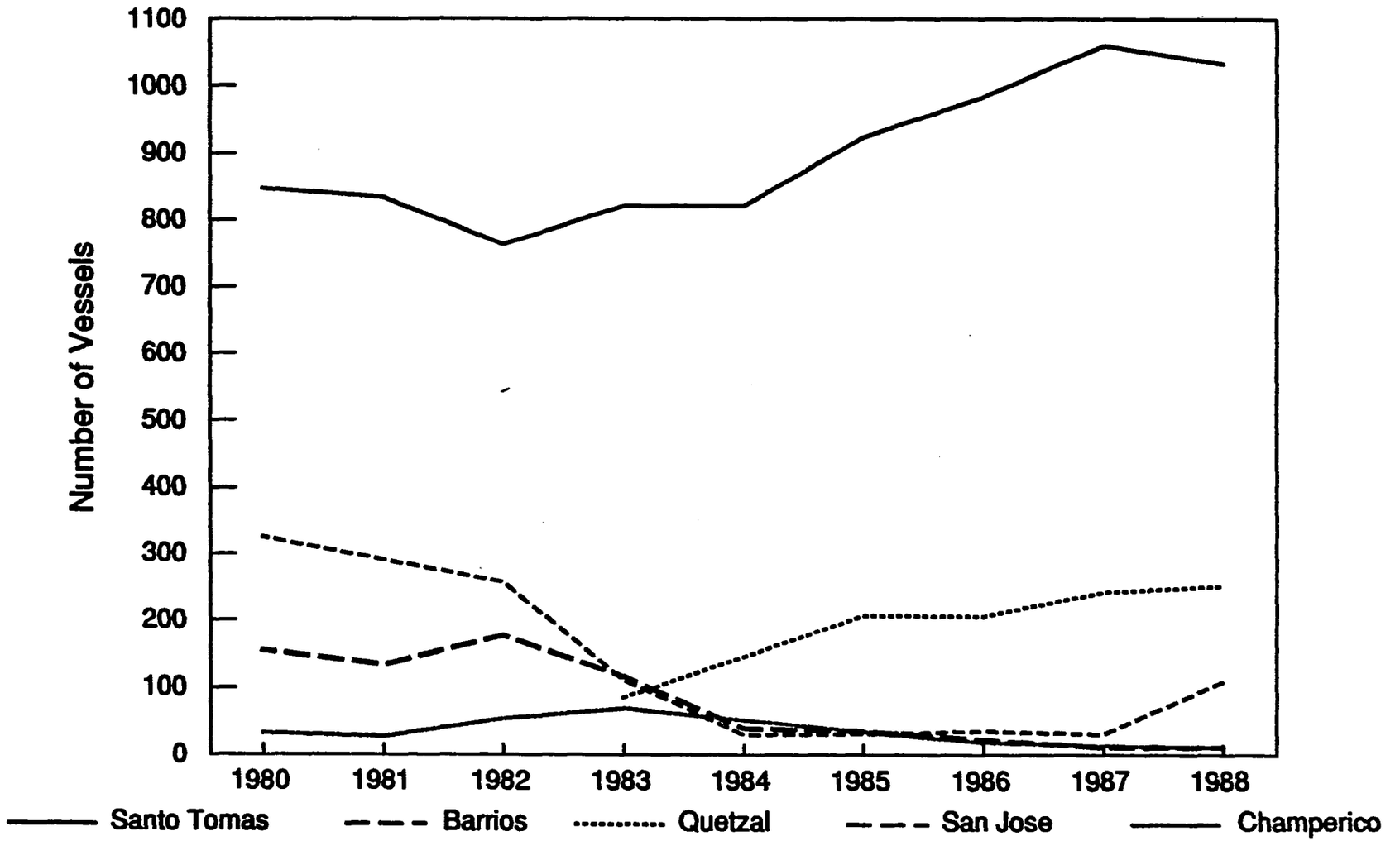
The opening of Puerto Quetzal in 1983 resulted, within a few years, in eliminating entirely the accommodation of nonpetroleum traffic at Puerto San Jose, and none of this traffic is expected to return to Puerto San Jose in the future. Much of this nonpetroleum traffic comprised sugar exports. Santo Tomas also accommodated some significant quantities of sugar exports before the opening of Puerto Quetzal to traffic, but since 1984 (the first full year of Puerto Quetzal operation), nearly all sugar exports have gone out of Puerto Quetzal. Still, as Table 14 shows, until 1989 containerized traffic at Quetzal

Table 14. Vessel Calls at Guatemalan Ports, 1980-1989

Port and Vessel Type	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Puerto Santo Tomas										
Roll-on Roll-off vessels	212	212	171	171	177	136	155	181	169	186
Grain boats	38	50	40	35	30	36	30	27	27	28
Combination ships	-	2	4	6	3	33	34	79	79	88
Tankers	69	58	83	106	93	79	95	103	99	80
General cargo ships	294	329	289	321	295	201	419	347	190	175
Passenger boats	19	8	7	1	2	-	11	15	8	1
Containerships	96	104	140	173	201	226	238	304	301	276
Refrigerated vessels	-	-	-	-	-	199	-	-	158	120
Other vessels	120	71	29	8	20	14	2	4	3	33
Subtotal	848	834	763	821	821	924	984	1060	1034	987
Puerto Barrios										
Grain boats	70	61	42	NA	16	16	14	9	64	NA
Mineral boats	28	9	-	NA	-	-	-	-	10	NA
Tankers	14	13	5	NA	11	15	16	9	-	NA
Banana boats	213	208	210	NA	-	-	-	1	29	NA
Other vessels	-	-	-	NA	3	-	5	12	6	NA
Subtotal	325	291	257	111	30	31	35	31	109	NA
Puerto Quetzal[a]										
Roll-on Roll-off vessels				9	23	23	17	32	38	38
Grain boats				30	15	3	12	9	11	15
Tankers				2	4	6	1	-	2	5
General cargo ships				42	101	149	163	181	159	187
Passenger boats				-	-	-	-	-	-	3
Containerships				-	3	26	13	21	26	54
Other vessels				2	-	-	-	-	16	11
Subtotal				85	146	207	206	243	252	313
Puerto San Jose										
Tankers	9	12	15	NA	NA	NA	NA	11	12	NA
General cargo ships	146	121	162	NA	NA	NA	NA	-	-	NA
Subtotal	155	133	177	116	39	35	23	11	12	NA
Puerto Champerico										
General cargo ships	32	27	54	69	NA	34	19	14	12	NA
Total: Five Ports	1,360	1,285	1,251	1,202	1,036[b]	1,231	1,267	1,359	1,419	NA

[a]Puerto Quetzal was under construction during 1980-1982 and did not open to traffic until 1983.
[b]Excluding Champerico.
NA= data not available to GTTIS.
Sources: Port Authorities of Santo Tomas, Quetzal, Champerico; FEGUA; CEPAL: "Istmo Centro Americano: Estadisticas de Transporte, 1983."

Figure 5. Vessel Calls at Guatemalan Ports



Source: Table 5.

had grown only modestly, with an average frequency during 1985-1988 of fewer than one containership per fortnight.

Table 15 identifies nonpetroleum cargo volumes at Guatemalan ports during 1986-1988, except that GTTIS was unable to obtain data on any nonpetroleum cargo that might have been accommodated at Puerto San Jose in 1986. The table shows that Santo Tomas accommodates nearly three-quarters of Guatemala's nonpetroleum port cargo, with Puerto Quetzal accounting for most of the remainder and Puerto Barrios and Puerto Champerico accounting, together, for slightly less than 3 percent of the total. In the view of GTTIS, Puerto Champerico operations are likely to be halted within a few years because the limited traffic offering would not justify any significant effort to rehabilitate the port. Puerto Barrios, however, is likely to be improved by the private sector, as will be discussed later in this chapter. Even so, most nonpetroleum port cargo will continue to rely on the ports of Santo Tomas and Quetzal, and the operations, problems, and plans for development of these two major ports are discussed in the following sections.

Puerto Santo Tomas de Castilla

The port of Santo Tomas began operation in the 1960s and since that time has superseded Puerto Barrios as the principal port of Guatemala. These two ports are located quite close together on the Caribbean coast and are connected by a 10-kilometer road, currently in highly deteriorated condition. The two ports are slightly more than 300 kilometers from Guatemala City and are also connected to Guatemala City by rail. Puerto Santo Tomas is owned by the government, operated by the quasi-autonomous Empresa Portuaria National Santo Tomas de Castilla (EPNSTC), and directed by a junta derectiva (board of directors).

Table 16 provides a breakdown of the export traffic at Santo Tomas over a 13-year period, 1977-1989. The table indicates that, during 1983-1985, the port took on virtually all banana traffic, diverting most of the traffic from Puerto Barrios. During the same period, as shown in Table 16, sugar exports were directed away from Santo Tomas to Puerto Quetzal. Of particular interest to the GTTIS are the trends in exports of fruits and vegetables and of manufactured goods. Fruit and vegetable exports grew rapidly from 1977 to 1987, declined somewhat in 1988, and recovered in 1989; these exports represented less than 1 percent of total exports in 1977, whereas they averaged just under 6 percent of total exports during 1986-1989. Expansion of manufactured goods exports grew rapidly early in the period, slumped from 1980 to 1983, then recommenced rapid growth which was sustained through 1989 (indeed, growth from 1988 to 1989 was impressive, at 23.6 percent).

Except for some limited number of drums of heavy petroleum derivatives that are handled at the port's conventional berths, crude

Table 15. Guatemalan Port Nonpetroleum Cargo Throughput, 1986-1988

Ports and Direction of Trade	Cargo Throughout (thousands of metric tons) 1986	1987	1988	3-year total	Annual average	% of annual average
Puerto Santo Tomas						
Imports	1,045	1,156	1,218	3,419	1,140	41.8
Exports	839	904	811	2,554	851	31.2
Total	1,884	2,060	2,029	5,973	1,991	73.0
Puerto Barrios						
Imports	39	50	55	144	48	1.8
Exports	13	14	3	30	10	0.4
Total	52	64	58	174	58	2.2
Puerto Quetzal						
Imports	223	344	283	850	284	10.4
Exports	369	334	409	1,112	371	13.6
Total	592	678	692	1,962	655	24.0
Puerto Champerico						
Imports	2	1	-	3	1	-
Exports	24	13	18	55	18	0.7
Total	26	14	18	58	19	0.7
All ports[a]						
Imports	1,309	1,551	1,556	4,416	1,472	54.0
Exports	1,245	1,265	1,241	3,751	1,250	46.0
Total	2,554	2,816	2,797	8,167	2,726	100.0

[a]GTTIS was unable to obtain port cargo throughput information for Puerto San Jose, and there may have been small volumes of nonpetroleum cargo accommodated at San Jose in 1986. In 1987 and 1988, however, only tankers called at San Jose and nonpetroleum traffic in these years was apparently nil.
Sources: Port Authorities of Santo Tomas, Quetzal, and Champerico, and FEGUA.

Table 16. Guatemalan Exports Through Puerto Santo Tomas de Castilla
(metric tons)

Commodity	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1986-1989 average	% of 1986-1989 total
Agricultural exports															
Bananas	98,971	22,025	19,915	22,975	11,178	6,329	177,487	297,582	356,913	372,922	382,520	299,127	273,629	332,050	32.0
Coffee	115,472	127,232	215,268	112,464	128,386	156,881	124,243	151,316	199,018	177,962	184,233	172,864	192,499	181,890	17.5
Sugar	144,457	87,350	48,563	119,629	38,287	90,267	14,828	2,404	400	-	-	2	326	82	-
Fruits and vegetables	3,721	6,205	9,223	11,051	13,310	18,495	18,968	26,913	34,901	55,556	64,417	57,586	65,466	60,756	5.9
Sesame and cardamom	-	-	-	-	19,769	17,375	15,822	19,700	23,649	25,950	32,781	31,192	28,073	29,499	2.8
Other agricultural exports	35,541	43,929	34,848	38,019	37,786	34,220	30,073	36,751	38,514	32,772	30,137	29,923	41,556	33,598	3.2
Subtotal	398,162	286,741	327,817	304,138	248,716	323,567	381,421	534,666	653,395	665,162	694,088	540,699	601,549	637,875	61.4
Mineral exports	1,368	2,910	6,074	13,763	9,502	1,165	1,118	21	1,360	1,174	5,480	5,136	7,811	4,900	0.5
Manufactured and other nonpetroleum	83,105	114,809	147,854	146,487	128,529	107,838	102,740	129,301	157,171	172,428	204,971	215,159	265,981	214,635	20.7
Subtotal: nonpetroleum exports	482,635	404,460	481,745	464,388	386,747	432,570	485,279	663,988	811,926	838,764	904,539	810,994	875,341	857,410	82.6
Petroleum exports[a]	4	163	6	111,219	105,497	222,106	309,906	177,395	64,964	253,212	185,609	155,061	127,332	180,304	17.4
Total exports	482,639	404,623	481,751	575,607	492,244	654,676	745,185	841,383	876,890	1,091,976	1,090,148	966,055	1,022,673	1,037,714	100.0

[a]Since 1980, nearly all crude petroleum. Petroleum product exports totaled just 1,809 tons over the entire 1977-1989 period, of which 1,478 tons were exported in one year, 1981. Petroleum product imports at Santo Tomas totaled 262,000 tons in 1989, and averaged 238,000 tons over the 1986-1989 period, representing 17 percent of Santo Tomas' import cargoes.
Source: EPNSTC.

petroleum and petroleum products are accommodated at a dedicated, high-volume petroleum berth and do not significantly affect other port operations. In assessing the adequacy of the port to accommodate export growth, therefore, GTTIS was primarily concerned with the growth trend of nonpetroleum cargo. Referring to Table 16, with regard to nonpetroleum exports, two distinct periods are indicated, separated by a single transition year (1984); from 1977 through 1983, nonpetroleum exports averaged approximately 450,000 tons per annum, and from 1985 through 1989, levels of these exports averaged 850,000 tons per annum. This growth occurred despite the fact that Puerto Quetzal opened to traffic in 1983 and diverted at least sugar exports from Santo Tomas; the principal reason for the sizable jump in Santo Tomas' nonpetroleum export tonnage from 1977-1983 to 1985-1989 was the diversion of banana exports from Puerto Barrios, but the growth trends for fruits and vegetables and for manufactured exports, discussed above, also contributed significantly to the large jump in export levels.

The adequacy of port facilities to accommodate demand depends not only on the trends of annual demand but also on the seasonality of demand and the effective capacity of the facilities to accommodate demand. As discussed below, Santo Tomas is not efficiently operated, yet so far the inefficiency of the port does not appear to have created serious port congestion. Table 17 indicates the berth occupancy record at Santo Tomas from 1984 to 1988. The uncongested conditions depicted in the table for 1984 correspond to the transition year for exports going from an annual level of 450,000 tons to average annual levels of 850,000 tons, as discussed above and shown in Table 16. Nonpetroleum imports that same year were around 950,000 tons. Growth of both exports and imports since that time has resulted in the onset of congestion, although still not at serious levels as, through the end of 1988, berth occupancy exceeded 80 percent in only 2 months.

Table 18 shows the seasonality of cargo at Santo Tomas in 1988. Three of the 4 months when cargo throughput represented 9 percent or more of the annual total correspond with the 3 months of 1988 when berth occupancy was above 70 percent (as shown in Table 17). The fact that there was not closer correspondence for the month of March between the high throughput level (9.9 percent of annual) shown in Table 18 and the moderate occupancy level (64 percent) shown in Table 17 is probably attributable to an unusually high level of petroleum exports in that month.

The discussion of Santo Tomas to this point might suggest that, although congestion at the port was not a serious problem through 1988, it could become serious in the near future because of continued growth of port cargo. However, this should not be the case for two reasons: first, there is considerable room for improving efficiency of the port, thereby permitting the port to accommodate appreciably higher cargo throughput levels without expanding the number of ship berths or experiencing serious traffic congestion; and, second, some portions of the traffic currently accommodated

Table 17. Puerto Santo Tomas de Castilla
Berth Occupancy

Month	1984	1985	1986	1987	1988
January	0.33	0.51	0.59	0.53	0.59
February	0.38	0.60	0.72	0.65	0.60
March	0.39	0.57	0.73	0.56	0.64
April	0.41	0.62	0.57	0.73	0.58
May	0.39	0.66	0.77	0.69	0.74
June	0.41	0.69	0.61	0.65	0.81
July	0.54	0.79	0.74	0.84	0.62
August	0.37	0.59	0.61	0.67	0.71
September	0.50	0.54	0.62	0.65	0.56
October	0.46	0.54	0.59	0.48	0.42
November	0.47	0.56	0.61	0.65	0.46
December	0.45	0.58	0.65	0.54	0.44

Note: Occupancy expressed as decimals; 1.00 would mean that all berths were occupied for 24 hours every day of the month. For a port the size of Santo Tomas, any figure below 0.70 would mean relatively uncongested conditions, and serious congestion would occur only above 0.80.
Source: EPNSTC.

Table 18. Puerto Santo Tomas de Castilla Cargo Throughput by Month, 1988

Month	Volume (thousands of tons)			Percent of annual total		
	Exports	Imports	Total	Exports	Imports	Total
January	64.4	153.2	217.6	6.7	10.4	8.9
February	77.8	80.6	158.4	8.0	5.4	6.5
March	111.0	130.8	241.8	11.5	8.8	9.9
April	79.4	117.5	196.9	8.2	8.0	8.0
May	70.2	150.0	220.2	7.3	10.2	9.0
June	89.3	155.8	245.1	9.2	10.5	10.0
July	64.0	99.1	163.1	6.6	6.7	6.7
August	92.6	134.2	226.8	9.6	9.1	9.3
September	54.5	130.2	184.7	5.6	8.8	7.6
October	89.6	106.3	195.9	9.3	7.2	8.0
November	68.1	122.5	190.6	7.1	8.3	7.8
December	105.1	98.3	203.4	10.9	6.6	8.3
Annual total	966.0	1,478.5	2,445.5	100.0	100.0	100.0

Note: Figures are for total cargo throughput, including crude petroleum exports and petroleum product imports. Because of the inclusion of petroleum and petroleum product traffic, and the high handling rates for these commodities, with rapid tanker turnaround, high monthly levels of cargo throughput might not necessarily correspond to the high levels of berth occupancy shown in Table 17 for 1988. Nevertheless, the peak month for cargo throughput, June, when 10.0 percent of annual traffic was accommodated, does in fact correspond to peak berth occupancy of 0.81 (81 percent) shown for June in Table 17.

Source: EPNSTC.

at Santo Tomas can be expected to divert to Puerto Barrios (bananas) and Puerto Quetzal (coffee and other exports and imports) with improvement of facilities and services at those ports (discussed in later sections of this chapter).

Efficiency at Santo Tomas can be achieved by improving handling rates per hour and increasing actual working time per vessel berth-day. Per-hour handling rates are low for the following reasons:

- The port is vastly overstaffed, perhaps by 80 percent. The result is that work rules at the port are designed for use of excessive labor, without any objective of achieving efficiency.

- There is no cold storage area at the port, which means that "just-on-time delivery" is the rule to avoid spoilage losses. The resulting peaks and valleys of delivery of perishables (bananas, other fruits, vegetables, fishery products, meat, etc.) cause considerable land-side congestion at the port whenever large numbers of delivery vehicles converge.

- The port has inadequate handling equipment, especially for handling containers. Containers are moved between the dock and on-board ship mostly by using ship's gear, and forklifts handle container movements along the quay. Container handling rates achieved at Santo Tomas are about one-half of what can be expected of appropriately equipped container terminals in developing countries (about 10 boxes per ship-hour).

- There is an almost total lack of storage and parking control at the port. Goods and empty containers are stored or parked in inappropriate places (including on the quay itself) and for excessive periods of time. Efficient ports permit little or no long-term storage within the port area, whereas as much as half of the entire port of Santo Tomas is used for such storage, sometimes even for periods of more than a year. (An egregious example, in 1990, is the inability to move out PL 480 wheat, in storage for more than 6 months, because Guatemala City bakers have failed to agree on allocation—so the wheat rots, feeds port-based rodents, and takes up valuable space at the port.)

Laborers at the port of Santo Tomas are all government employees and are organized into three cargo handler (stevedoring/arrastre) unions. Until July 1990, all of these laborers were paid on an hourly basis, which offered no incentive to improve labor productivity; beginning in July 1990, however, these cargo handlers are being paid on a volume basis, which should help to improve productivity.

The port is inefficient not only because of low per-hour handling rates, but also because of too few hours of work. Table 19 indicates that, on average, cargo handling activity is under way only slightly more than half of the time that vessels are berthed. Two-shift operations with significant overtime seem to be the rule at Santo Tomas, whereas the surplus labor and the fairly high levels of berth occupancy in most months suggest that the port should go to 24-hour operation.

The rapid growth of export traffic at Santo Tomas, particularly of manufactured and perishable goods during the 1980s, suggests that, notwithstanding the inefficiency of the port and the lack of appropriate equipment and storage facilities, the port has not seriously impeded the growth of Guatelaman exports. Moreover, as will be discussed in later sections of this chapter, future development of Puerto Barrios and Puerto Quetzal can be expected to divert some cargo traffic from Santo Tomas, thereby helping to relieve the port of its incipient congestion. Thus, it cannot strictly be said that improvement of Santo Tomas' operations is absolutely essential in the short run to avoid impedence to Guatemalan export growth.

On the other hand, users of inefficient transport facilities always incur incremental costs in comparison with use of efficient facilities. In the case of Santo Tomas, shippers and importers are paying for higher than necessary labor costs, congestion costs resulting from "just-in-time" delivery, ship delays due to slow handling rates per ship-berth-day, and probably (but GTTIS was unable to obtain good information on this) goods value losses due to both commodity damage and loss, which are due in turn to lack of appropriate storage space and chaotic quay conditions. It is highly desirable that Santo Tomas become an efficient, modern port. In the short term, such a port would produce significant user savings and perhaps give rise to some increments of export and investment growth along the Caribbean coast of Guatemala. In the longer term, Santo Tomas, the railway, and Puerto Quetzal could constitute a Guatemalan land bridge to accommodate transit traffic. At present, all three facilities are wholly inadequate, and no serious consideration should be given to the land bridge possibility. In addition to efficiency improvements, Santo Tomas water depths, currently 8.5 meters at low water alongside the quay, will need to be increased if the port is to be recognized as a major international port.

During the period of GTTIS field work (early 1990), another study was ongoing, with German financing (GTZ), to identify how the operations of Santo Tomas might be improved. GTTIS cannot anticipate the detailed

Table 19. Puerto Santo Tomas de Castilla Berth
Utilization Rates, 1988

Month	Proportions of Total Berth Time (%)					Proportion of Berth-occupied Time (%)		
	Unoccupied	Occupied[a]	Vessels Unattended at Berth	Vessels Attended at Berth	Actual Working Time	Vessels Unattended at Berth	Vessels Attended at Berth	Actual Working Time
January	34	66	18	48	29	27	73	44
February	40	60	18	42	33	30	70	55
March	24	76	20	56	41	26	74	54
April	33	67	21	46	36	31	69	54
May	21	79	24	55	41	30	70	52
June	32	68	22	46	36	32	68	53
July	29	71	24	47	34	34	66	48
August	22	78	26	52	40	33	67	51
September	30	70	24	46	35	34	66	50
October	30	70	28	42	29	40	60	41
November	41	59	15	44	36	25	75	61
December	32	68	19	49	38	28	72	56
Annual average	31	69	22	47	36	32	68	52

[a] It is not clear to GTTIS why the figures of this column should be significantly different from the figures of the final column of Table 17. Only the February figures of the two tables are in agreement.

Source: EPNSTC.

findings and recommendations of the port operations study, but the principal near-term measures that appear eminently desirable include

- Imposition of penalty charges on all nonpetroleum cargo stored within the port area for more than 30 days, with confiscation of goods if penalty charges are not promptly paid or if, in any case, storage terms exceed 90 days.
- Early retirement with benefits (paid by the government) of all dock workers 50 years of age or older.
- Improved use of other labor by rewriting of work rules and going to standard, 24-hour (3-shift) operations.
- Discussion with GREXPO and CUTRIGUA regarding investment by those associations in cold storage warehousing at the port, to be operated as well as developed by private sector.
- Announcement by EPNSTC of willingness to enter into long-term leasing of a section of the quay for development and operations of a full container terminal.
- Development of an independent storage facility near Puerto Santo Tomas for longer-term bulk container storage and to ensure that the port is used only for expeditious transfer of cargo between trucks and ships.

GTTIS does not believe that privatization of the full port of Santo Tomas is essential to improve operating efficiency, but it would be difficult to significantly improve operating efficiency if no elements of privatization at all were injected into port operations. A privately operated container terminal would, first, greatly improve handling of containers, and, second, force government employees working other portions of the quay to become more competitive to prevent the trend to containerization from accelerating. Similarly, permitting GREXPO and/or CUTRIGUA to provide refrigerated storage area at the port could help the port maintain its share of perishable export traffic; otherwise, significant conversion to air transport appears likely. One problem with continued reliance solely on EPNSTC to make the necessary investment at the port is that labor force end-year bonuses, according to GREXPO, have in the past taken precedence over investment, so

that unless sufficient revenue has been generated for both purposes, investments have not been made.

Puerto Quetzal

Puerto Quetzal opened to traffic in 1983 and quickly took over the handling of general cargo traffic from Puerto San Jose and diverted sugar traffic from Santo Tomas as well. Otherwise, traffic growth has not been rapid, and, until 1988, the port accommodated only modest amounts of containerized cargoes. Table 20 shows the types of vessels that have served Puerto Quetzal from the opening of the port in 1983 to 1988. Altogether, general cargo vessels accommodated 72.6 percent of Puerto Quetzal traffic in that period, and containerships and RORO vessels accommodated just 7.5 percent.

Table 21 indicates the seasonality of traffic at Puerto Quetzal in 1 year, 1988. Unlike Santo Tomas, which has only moderate month-to-month traffic variation (see Table 18), Puerto Quetzal shows substantial variation, ranging from just 1.7 percent of annual traffic to more than 20 percent of the annual total in the single month of May. This is because Puerto Quetzal is largely a two commodity port, sugar exports and fertilizer imports, both of which are highly seasonal. This means that the port's labor requirement is very different during the March-June peak traffic season than it is during the remainder of the year.

Puerto Quetzal has not institutionalized inefficiency quite to the extent that Santo Tomas has. Laborers, for example, are contracted from the private sector, so that, theoretically, labor levels can be adjusted to meet demand. However, it is the impression of GTTIS that such adjustments are not made easily at Puerto Quetzal, and labor concerns may largely or at least partially explain why Puerto Quetzal, 7 years after commencing to operate, is continuing to employ an extremely inefficient method of handling sugar. The procedure is to move bagged sugar from mills and refineries to the port, then to cut the bags open by hand when loading the sugar into the holds of ships. The loading procedure requires 14 days on the average. GTTIS could not learn precisely how the unnecessary costs incurred through this abysmal system are shared between the Guatemalan sugar growers, the mills and refineries, and the ocean tramper industry. It is likely, though, that the proportion borne by ship operators is declining, as the world is moving from a period of heavy over-capacity of shipping (during most of the 1980s) to a market nearly in balance in 1990. The sugar handling situation is only made worse by the fact that Puerto Quetzal has acquired bulk handling equipment for sugar exports (as well as for grain and fertilizer imports), but it has been found to be inappropriate.

Table 20. Movement of International Cargo Through Puerto Quetzal, by Type of Vessel

(thousands of tons)

	1983	1984	1985	1986	1987[a]	1988	1983-1988 total	% of 6-year total
Total	277.9	428.7	478.7	628.0	164.3	692.3	2,669.7	100.0
Exports[b]	186.4	304.0	369.0	369.2	67.1	408.8	1,704.5	63.8
General cargo	183.9	246.6	298.9	359.4	66.0	386.1	1,540.9	57.7
Tankers	-	54.9	62.3	-	-	-	117.2	4.4
Roll-on Roll-off	2.5	1.6	0.2	-	-	-	4.3	0.1
Container vessels	-	0.9	7.6	9.8	1.1	22.8	42.2	1.6
Imports[c]	91.5	124.7	109.7	258.8	97.2	283.4	965.2	36.2
General cargo	17.4	61.0	63.6	71.7	59.2	125.0	397.9	14.9
Grain boats	71.0	53.6	31.9	174.0	37.0	114.8	482.3	18.1
Mineral boats	-	-	-	-	-	5.4	5.4	0.2
Roll-on Roll-off	3.1	4.1	3.0	1.8	0.8	6.3	19.1	0.7
Container vessels	-	6.0	11.2	11.3	0.1	31.9	60.5	2.3

[a]Fragmentary data only. Actual traffic totaled 678,000 tons in 1987, of which 344,000 tons were imports and 334,000 tons were exports.

[b]Puerto Quetzal exports were dominated by sugar products during 1983-1988; 1,705,000 tons of sugar and 117,000 tons of molasses represented 86.9 percent and 6.0 percent, respectively, of total exports of 1,962,000 tons over the 6-year period. This total differs from the 1983-1988 total shown in this table because of the fragmentary data for 1987.

[c]Imports of 1,177,000 tons during 1983-1988 were composed mainly of 780,000 tons of fertilizers (66.3 percent of the total) and 216,000 tons of metal products (18.4 percent of the total).

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Table 21. Puerto Quetzal Cargo Throughput by Month, 1988

Month	Volume (thousands of tons)			Percent of annual total		
	Exports	Imports[a]	Total	Exports	Imports	Total
January	2.0	9.7	11.7	0.5	3.5	1.7
February	29.1	21.3	50.4	7.1	7.8	7.4
March	81.2	20.2	101.4	19.9	7.4	14.8
April	75.0	8.7	83.7	18.3	3.2	12.3
May	49.9	87.9	137.8	12.2	32.1	20.2
June	36.4	52.8	89.2	8.9	19.3	13.1
July	53.8	6.9	60.7	13.2	2.5	8.9
August	9.3	29.7	39.0	2.3	10.9	5.7
September	29.5	7.5	37.0	7.2	2.7	5.4
October	20.6	14.0	34.6	5.0	5.1	5.1
November	8.4	7.6	16.0	2.1	2.8	2.3
December	13.6	7.3	20.9	3.3	2.7	3.1
Annual total	408.8	273.5	682.4	100.0	100.0	100.0

[a]Elsewhere the 1988 import total for Puerto Quetzal is shown as 283,000 tons (see Table 15). GTTIS cannot explain the discrepancy.

Source: Empresa Portuaria Quetzal.

Similarly, the port has acquired mismatched cranes, intended to handle containers. As a result, ship's gear is employed to load and unload containers, and forklifts are used to move the containers between the quay and storage areas. The handling rate is 3 to 6 containers per hour—not good even when using ship's gear—and properly matched cranes would probably have resulted in a handling rate of around 10 containers per hour.

Access to Puerto Quetzal is inadequate. The road from Escuintla to Puerto San Jose and (6 kilometers further on) Puerto Quetzal is winding and in poor condition, so that trucks travel the road at an average running speed of just 10 kilometers per hour. Large articulated vehicles may not be able to negotiate the road even at the slow speeds of the rigid, sugar trucks. A new road is being constructed between Puerto Quetzal and Escuintla, and when completed, significant or even substantial traffic diversion from Santo Tomas to Puerto Quetzal is likely to occur, particularly for shipments to the West Coast of the United States and to Pacific Rim countries. Much of Guatemala's coffee exports, mostly grown in western Guatemala, is likely to be diverted, and because Puerto Quetzal is only 112 kilometers from Guatemala City, some significant amount of manufactured exports and imports can be expected to divert as well.

The new Escuintla-Puerto Quetzal road is nearly complete except that four or five bridges are missing; as far as GTTIS could tell in looking at this road, bridge construction is not now ongoing, and it is unclear when these bridges might be completed. The top priority in the entire transport sector of Guatemala has to be completion of these few bridges. Until they are built, Puerto Quetzal will not play its full potential role in the Guatemalan economy.

Puerto Quetzal as it now exists represents only the first phase of the development of the port. The plan is to involve the private sector in the development and operation of second phase development. In the view of GTTIS, the private sector might desirably become involved in completion of first phase development as well. As was recommended by GTTIS for Santo Tomas, CUTRIGUA and GREXPO should be looked to for provision of suitable storage areas, at least for perishable commodities. In fact, CUTRIGUA is trying to induce the shipping conference, CALA, to institute regular liner service at the port and to enter into time-volume arrangements with CUTRIGUA, which would make it appropriate for CUTRIGUA to participate in establishing the appropriate storage areas requisite for honoring their side of time-volume arrangements.

Also, as recommended by GTTIS for Santo Tomas, the private sector should be asked to develop and operate a container terminal under a long-term contract with Empresa Portuaria Quetzal. Although current volumes of container traffic might suggest that consideration of a full terminal for containers is premature at this time, GTTIS believes that completion of the missing bridges along the new Escuintla-Puerto Quetzal road will result in a quantum jump in container traffic (including ventilated containers, or reefer

boxes, for coffee and other agricultural commodities) at the port. If so, then it is not too early to begin the terminal development effort by announcing the intention and requesting private sector bids to act in the capacity of developer and operator of a terminal. As mentioned with regard to the Guatemalan railway and the port of Santo Tomas, there is the long-term possibility that Puerto Quetzal, and especially its container terminal, could eventually function as part of a Guatemalan land bridge.

In addition to contributing to storage areas, a container terminal, and second-phase development of Puerto Quetzal, the private sector might desirably be induced to redo the bulk sugar terminal and perhaps other bulk handling facilities as well. This effort should be considered urgent, as substantial savings should be possible in converting from egregiously inefficient manual operations to highly efficient bulk handling. A U.S. Department of Agriculture report, dated October 23, 1987, on "The Feasibility of Constructing Agriculturally-Related Port Facilities in Guatemala," estimated that the benefits of installing an improved sugar handling facility at Puerto Quetzal would have been, at that time, equivalent to US $2.82 per metric ton of sugar.

Puerto Barrios

Puerto Barrios was the principal port of Guatemala from the time of its opening in 1905 until Santo Tomas was opened to traffic in the 1960s; even after that time, Puerto Barrios continued to accommodate most banana exports through 1982, but continued deterioration of the port finally led to diversion of these exports to Santo Tomas. Puerto Barrios was heavily damaged by an earthquake in 1976. Continued siltation has limited the draft of vessels that can be accommodated at the port (both in the channel and alongside the quay) to less than 6 meters.

FEGUA, which currently has responsibility for Puerto Barrios, is intending to largely relinquish that responsibility to the private sector, and specifically to BANDEGUA. The expectation is that BANDEGUA will dredge to increase water depth to 11 meters, extend and renew the pier, and expand storage facilities. This shifting back to Puerto Barrios of at least BANDEGUA's banana exports is probably a good move from the standpoint of other traffic being served at Santo Tomas because that port, as discussed above, has now begun to experience congestion. If COBIGUA's bananas, as well as BANDEGUA's bananas, are accommodated at Puerto Barrios again, then as much as 40 percent of Santo Tomas' nonpetroleum exports might be shifted.

Although the railway, primarily, may be relied upon to accommodate banana exports destined for Puerto Barrios, the 10-kilometer road connecting Santo Tomas to Puerto Barrios should also be improved. Currently the road

is in extremely bad condition, requiring 1 hour for cargo-laden vehicles to negotiate its full 10 kilometers. Passenger cars and small vehicles can make the trip in 15 to 30 minutes.

Shipping Services

Members of CALA provide Santo Tomas with regular liner services. This shipping conference provides connections for other Central American ports, as well, to U.S. gulf coast and eastern seaboard ports. Referring back to Table 14, most RORO vessels, containerships, and refrigerated vessels are operated by CALA members, whereas all of the tankers and most of the general cargo conventional vessels are not. Because GTTIS' concern was the adequacy and costs of transport services and the effects these might have on the growth of Guatemalan exports, it was necessary to consider the possibility that the monopolistic aspects of shipping conferences, and specifically of CALA, might have resulted in inadequate shipping services and/or high charges for services. In the view of GTTIS, CALA services are satisfactory, and service charges are reasonable and fair. The following points are pertinent to this conclusion:

- CALA members have kept pace with shipping technology, except that containerships have on-board gear; the delay in relying on shore-based equipment to handle loading and unloading of containerships is due to inadequacies of the ports served rather than to any policy of the conference. In some cases where a shipping conference is strong, adoption of new and lower-cost technology is delayed; for example, the United Kingdom-West African Lines (UKWAL) shipping conference still employs only combination vessels and has purposely delayed going to more cost-efficient containerships and RORO vessels.

- CUTRIGUA is satisfied with CALA services and charges at Santo Tomas, as evidenced by CUTRIGUA's ongoing efforts to induce the conference to initiate similar services at Puerto Quetzal, connecting the port to North American Pacific coast ports.

- There are in fact other shipping services offered at Santo Tomas, and should CALA members begin to engage in overcharging, the result would be a slowing, or even reversal, of the trend to greater cargo containerization, and/or nonconference

containerships and RORO vessels would be attracted to the market.

- Shipping charges are, in fact, reasonable (see discussion in the final section of this chapter), and CALA offers exporters discount possibilities if they guarantee minimum levels of cargo within specified time periods (time-volume arrangements). During the period of worldwide shipping overtonnaging in the 1980s, CALA shipping charges declined somewhat, and this failure to hold charge levels is usually evidence of internal price competition, that is, competition among membership of a conference.

These points attest to the absence of any significantly adverse effects on shipping services and shipping costs from the monopolistic aspects of the conference. It should be noted, however, that CALA offers a positive advantage, as do liner shipping conferences generally, which should not be disregarded when assessing the role of CALA in support of trade; that is, the conference offers regular and reliable services. Investors and exporters value these service characteristics highly, which is why CUTRIGUA is trying to induce CALA to institute services at Puerto Quetzal, despite the fact that there is already sufficient nonliner shipping capacity available to accommodate all traffic offering at that port.

Shipping Costs

GTTIS was interested in three cost comparisons for exports through Santo Tomas:

- Transport cost structure, to determine the extent to which there might be large cost elements that the Guatemalan public and private sectors might seek to reduce and thereby help stimulate growth of exports.
- Transport cost levels for Guatemalan exports relative to the costs incurred by exporters of other countries of the region.
- Transport cost levels relative to the delivered value of exports.

Table 22 indicates the structure of transport costs for a number of containerized shipments through the port of Santo Tomas. As shown in the table, despite the poor state of Guatemalan roads and the inefficiency of the port of Santo Tomas, transport costs in Guatemala represent just 13.4 percent of total transport costs, before consideration of inland transport costs to final destinations in the United States. Transportation improvements in Guatemala, while desirable from the standpoint of user cost savings, cannot be expected to significantly affect the Guatemalan export market because final delivered costs could be reduced only slightly. In terms of costs per ton, the average transport cost total of the Table 22 shipments is slightly less than U.S. $200, of which costs in Guatemala are U.S. $26.50.

Guatemalan port charges are lower than the charges at ports of neighboring Central American countries. Costa Rica imposes the highest charges: the equivalent of U.S. $26 per ton on all exports accommodated at Puerto Limon on the Caribbean coast. At Santo Tomas, the per-ton handling charge for both bananas and coffee is equivalent to U.S. $4.65, and most other exports bear a per-ton handling charge of U.S. $5.25 (equivalent). El Salvador's port of Acajuitla imposes a per-ton charge equivalent to U.S. $6.30 on coffee and bananas, and a charge equivalent to U.S. $7.50 per ton on most other cargo. Puerto Cortez in Honduras imposes a charge equivalent to U.S. $5.40 on coffee and U.S. $6.80 per ton on most other exports.

Where ocean shipping charges are concerned, all of the ports just mentioned are served by CALA, so charges are roughly comparable except that the need to pass through the Panama Canal adds to costs, and entering into time-volume arrangements with CALA will lower per-ton charges. This relationship of shipping charges can be illustrated from the December 1989 quotations for shipments of frozen melon balls in consignment sizes of 16 tons or more; charges quoted below are on a per-short-ton basis and expressed in U.S. dollars.

Port of Origin	*To Gulf ports*	*To South Florida*	*To South Atlantic ports*
Puerto Limon, Costa Rica	152	138	152
San Salvador, El Salvador	178	178	182
Puerto Cortez, Honduras	157	152	152
Santo Tomas, Guatemala	152	152	152

A 1989 World Bank discussion paper, "Do Caribbean Exporters Pay Higher Costs?", uses the "nominal freight factor" to compare the reasonableness of export transport charges. The nominal freight factor is the ratio of international transport and insurance costs to the free-alongside-ship value in the country of origin. In making comparisons among countries, it should be kept in mind that the nominal freight factor tends to be higher for those

Table 22. Transport Costs of Sample Containerized Shipments, Puerto Tomas de Castilla to Miami, February 1990

Shipment Commodity	Shipment Size (tons)	Shipment Origin	Shipment Transport Charges (U.S. dollar equivalents)										
			Guatemala			Ocean Shipping				U.S. Port			
			Inland Transport	Port Handling Costs	Subtotal	Ocean Freight	Bunkering Surcharge[a]	Operations Surcharge	Subtotal	Handling and Documentation[b]	Security Surcharge[c]	Subtotal	Total Shipment Charges
Shoes	7	Guatemala City	345	37	382	940	150	28	1,118	430	75	505	2,005
Lettuce	19	San Lucas	436	98	534	1,219	188	37	1,444	430	84	514	2,492
Shrimp	19	Villanvava	426	100	526	3,553	190	107	3,850	430	86	516	4,892
Foliage	4	El Rancho	260	21	281	1,705	150	51	1,906	430	75	505	2,692
Yucca	20	San Lucas	380	105	485	1,880	200	56	2,136	430	90	520	3,141
Textiles	20	Santa Ana	361	102	463	1,502	195	-	1,697	430	88	518	2,678
Berries	20	San Lucas	436	102	538	2,867	195	86	3,148	430	88	518	4,204
Melons	22	Zacapa	190	86	276	2,898	190	87	3,175	430	99	529	3,980
Average shipment	16.4	-	354	81	435	2,070	182	56	2,308	430	86	516	3,259
Cost structure(%)	-	-	10.9	2.5	13.4	63.5	5.6	1.7	70.8	13.2	2.6	15.8	100.0

[a]Effective since 1979 to compensate for the cost of bunker fuel for ships. There is a minimum charge of $150.
[b]Includes $20 charge for documentation and handling costs to storage locations or vehicles.
[c]Effective since 1989 to compensate for cost of maintaining security for cargo and cost of checking to detect illegal substances.
Source: CALA.

countries exporting commodities with relatively low values per ton and long average shipment distances, and lower for those countries exporting commodities with relatively high values per ton and short average shipment distances. The volume of exports also affects the nominal freight factor because high volume tends to permit the use of large ocean vessels, contract shipping, and time-value arrangements with liner shipping, all of which lower transport costs relative to value. Finally, the relative reliance on sea transport versus air transport and long-distance road transport affects the nominal freight factor because greater reliance on these higher-cost modes for exporting would tend to increase transport costs per ton of exports.

With all of the foregoing caveats about the value of comparing nominal freight factors among countries, it is nevertheless interesting and useful to make the comparisons. Nominal freight factors identified by the 1989 World Bank discussion paper for Guatemala and a number of other countries, only for exports to the United States, from 1985 to 1987, are shown below (averages are unweighted by annual volume of exports during 1985-1987).

Country	*Average Nominal Freight Factors for Exports to the United States, 1985-1987*
Guatemala	8.8
El Salvador	4.7
Honduras	14.4
Costa Rica	12.7
Columbia	8.8
Venezuela	5.6
Ecuador	9.0
Brazil	7.7
Argentina	9.2

From the above, Central American countries in general appear to have a transport cost disadvantage as compared with South American countries; however, this may result from higher average value per export ton for South American countries (which export many manufactured goods to the United States) rather than any actual transport cost increments. In any case, Guatemala does not have an unusually high nominal freight factor and, in fact, has a significant advantage relative to Costa Rica, one of the principal competitor countries for nontraditional exports to the U.S. market. Another principal competitor country, Colombia, has an average nominal freight factor that is the same as Guatemala's, indicating that transport costs play little or no role in determiring their U.S. market shares.

Table 23 shows the ratio of international transport costs to the combined value of Guatemalan exports and imports in 1970 and 1975, and from

Table 23. Ratio of International Transport Costs to FOB Value of Guatemalan Exports and Imports, 1970, 1975, and 1980-1989

Year	Combined FOB Value of Guatemalan Imports and Exports (millions of U.S. dollars)	International Transport Costs for Imports and Exports (millions of U.S. dollars)	Transportation Costs as a Percentage of Import and Export Value (%)
1970	560.1	42.7	7.6
1975	1296.0	96.5	7.4
1980	2945.4	202.5	6.9
1981	2649.2	210.5	7.9
1982	2368.0	158.1	6.7
1983	2174.4	111.4	5.1
1984	2276.7	115.9	5.1
1985	2068.4	108.3	5.2
1986	1938.1	94.8	4.9
1987	2320.4	127.4	5.5
1988	2486.6	169.4	6.8
1989	2643.9	192.7	7.3
1980-89 average	2387.1	149.1	6.2

Source: 1970-1985, National Institute of Statistics; 1986-1989, Central Bank of Guatemala. It is not possible to separately identify export and import ratios of transport costs to commodity value from these sources because transport costs are separated, for balance-of-payment purposes, into payments to Guatemalan and non-Guatemalan bottoms, and each of these vessel/aircraft categories accommodates some Guatemalan exports and imports.

1980 to 1989. The principal points to be learned from the table are that the ratio is reasonable and not excessive in any year, and the ratio declined sharply during the period of worldwide overtonnaging of shipping in the 1980s.

Chapter 6

AIRPORTS AND AIR TRANSPORT SERVICES

Introduction

GTTIS investigated whether existing air service availability, quality, and cost might be acting in any way to impede investment and/or export growth in Guatemala. La Aurora, just south of Guatemala City, is the principal international airport of Guatemala, and GTTIS was principally concerned with assessing the adequacy of this airport and the services, especially air cargo services, provided there. Santa Elena, the Flores, El Peten airport, is the other international airport of Guatemala, but it currently serves only a few, short-distance, tourism-related international flights. A recent study by the Japan International Cooperation Agency (JICA), the "Study on the Development Project of La Aurora and Santa Elena Airports" (Airport Study), was very helpful to GTTIS, although GTTIS disagrees with the economic appraisal of the study. Background information on La Aurora and Santa Elena airports, gleaned from the Airport Study, is provided in Appendix B of this report; the appendix also provides GTTIS' evaluation of the Airport Study's methodology, findings, and recommendations. Essentially, GTTIS is nearly in agreement with the findings and recommendations of the Airport Study, except that, in the view of GTTIS, the Airport Study has greatly overstated the importance and urgency of implementing a major project at La Aurora, to relocate and rebuild the taxiway.

International air transport services are discussed in the following section of this chapter. The emphasis is on air cargo services, but passenger services must also be addressed because of the possibility that La Aurora may be approaching 100 percent capacity utilization; if true, this would potentially constitute a very serious problem for Guatemala. The Airport Study contends that 100 percent capacity utilization might occur as early as 1994, in which case planning and measures to forestall the problem would be urgently required.

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The final section of this chapter considers the current and potential role of domestic air transport services. Currently, the La Aurora-Santa Elena route is the only route provided with regularly scheduled services. In considering the desirability of new domestic routes being served, GTTIS was at a significant disadvantage because of the lack of information on airports and airfields other than La Aurora and Santa Elena. A study is needed to provide a more complete assessment of the possibility of an expanded role for domestic air transport services.

GTTIS expects the national transport planning effort, described briefly in the final section of Chapter 2 of this report and scheduled to get under way sometime in 1991, to address in more complete fashion than has been possible for GTTIS the important air transport questions raised but not fully answered in this report. These issues include developing a new international airport in Guatemala, increasing the number of points served by international airlines in Guatemala, and expanding the role of domestic air transport services.

International Air Transport Services

International Air Cargo Traffic

As of April 1990, La Aurora airport at Guatemala City is served by 16 international airlines, 2 of which are cargo airlines just commencing operations in April. Table 24 identifies these international carriers, the types of services they provide, and the points served outside Guatemala.

In 1989, air cargo at La Aurora increased by an extraordinary 145.7 percent above the preceding year—102.5 percent above the previous record level established in 1987. Table 25 indicate the growth of air cargo at La Aurora from 1981 to 1989. Table 26 identifies the seasonality of air cargo at La Aurora during the 1987-1989 period. The table shows a remarkably even monthly demand for air cargo services; except for the month of March, when only 7.5 percent of annual cargo was accommodated, the percentages for the other 11 months of the year are all in the narrow range of 8.0 to 9.0 percent of annual cargo. Exports are somewhat higher in January than in other months, whereas imports peak in the November-December period, probably because of the Christmas season. The lack of any significant peaks and valleys in the demand for air cargo services means that regularly scheduled services are appropriate for this market, and, as a rule, it should not be necessary for any exporters or groups of exporters to charter services.

Table 24. International Air Transport Services Provided at La Aurora Airport, Guatemala City, April 1990

Name of Carrier	Carrier Base (country)	Types of Services Provided	Foreign Points Served
Aeroquetzal	Guatemala	Passenger/cargo	Cancun (Mexico)
American/Eastern[a]	United States	Passenger/cargo	Miami
Compania Panamena de Aviacion (COPA)	Panama	Passenger/cargo and full cargo	San Salvador, Managua, San Jose, Panama City
Continental Airlines	Unites States	Passenger/cargo	Houston
Challenge Air[b]	United States	Cargo only	Various U.S. cities
Empresa Guatemaltaca de Aviation Aviateca (AVIATECA)	Guatemala	Passenger/cargo and full cargo	Mexico City, Los Angeles, Houston, New Orleans, Miami
Lineas Aereas Constarricenses (LACSA)	Costa Rica	Passenger/cargo	Los Angeles, New York City, San Jose
Lineas Aereas de Espana (Iberia)	Spain	passenger/cargo and full cargo	Santo Domingo, Madrid
Compania Mexicana de Aviacion (Mexicana)	Mexico	Passenger/cargo	Mexico City, Los Angeles, San Jose
Aerolineas Nicaraguenses (AERONICA)	Nicaragua	Passenger/cargo	Managua
Pan American World Airways (PAN AM)	United States	Passenger/cargo	Miami, New York City
Royal Dutch Airlines (KLM)	Netherlands	Passenger/cargo	Curacao, Amsterdam
Servicio Aero de Honduras (SAHSA)	Honduras	Passenger/cargo and full cargo	Tegucigalpa, San Pedro Sula (Honduras)
Sociedad Aeronautica de Medellin (SAM)	Colombia	Passenger/cargo	San Jose, San Andres Island (Colombia), Bogota
Taca International Airlines (TACA)	El Salvador	Passenger/cargo and full cargo	San Salvador, Managua, San Jose, Panama City, Los Angeles
Traslados[b]	Guatemala	Cargo only	Various U.S. and other cities

[a] Transfer of route from Eastern to American in process.
[b] Start-up of service in April 1990.
Source: Direccion General de Aviacion Civil and JICA Airport Study.

Table 25. International Air Cargo at La Aurora Airport, 1981-1989

Year	Volume of Cargo (metric tons)			Cargo Volume Indices (1981 = 100)		
	Exports	Imports	Total	Exports	Imports	Total
1981	8,311	8,541	16,852	100	100	100
1982	7,747	6,309	14,056	93	74	83
1983	7,508	6,695	14,202	90	78	84
1984	11,470	7,551	19,021	138	88	113
1985	10,666	5,495	16,161	128	64	96
1986	8,123	5,080	13,203	98	59	78
1987	15,333	8,229	23,562	184	96	140
1988	9,643	9,776	19,419	116	114	115
1989	30,832	16,881	47,713	371	198	283

Source: Direccion General de Aviacion Civil and JICA Airport Study.

Table 26. Seasonality of Air Cargo at La Aurora Airport, 1987-1989

Month	Imports					Exports					Total Air Cargo				
	Volume (metric tons)					Volume (metric tons)					Volume (metric tons)				
	1987	1988	1989	3-year total	% of total	1987	1988	1989	3-year total	% of total	1987	1988	1989	3-year total	% of total
January	833	652	1,212	2,697	7.7	501	1,558	3,364	5,423	9.7	1,335	2,210	4,577	8,122	9.0
February	545	1,303	1,240	3,088	8.9	852	679	3,388	4,919	8.8	1,397	1,982	4,628	8,007	8.8
March	711	1,070	1,166	2,947	8.4	1,225	570	2,034	3,829	6.9	1,936	1,640	3,200	6,776	7.5
April	573	670	1,355	2,598	7.4	1,138	1,037	2,627	4,802	8.6	1,710	1,707	3,982	7,399	8.2
May	514	998	1,668	3,180	9.1	1,222	1,130	1,690	4,042	7.2	1,736	2,129	3,558	7,223	8.0
June	657	641	1,484	2,782	8.0	1,434	748	2,499	4,686	8.4	2,097	1,388	3,983	7,468	8.2
July	622	843	1,316	2,781	8.0	1,135	622	2,951	4,708	8.4	1,757	1,465	4,267	7,489	8.3
August	587	622	1,452	2,661	7.6	1,344	886	2,967	5,197	9.3	1,931	1,508	4,419	7,858	8.7
September	511	794	1,304	2,609	7.5	1,590	539	2,709	4,838	8.7	2,101	1,332	4,013	7,446	8.2
October	648	596	1,447	2,691	7.7	1,674	913	2,324	4,911	8.8	2,322	1,509	3,770	7,601	8.4
November	1,023	624	1,566	3,213	9.2	1,783	520	2,055	4,358	7.8	2,806	1,144	3,621	7,571	8.3
December	1,006	963	1,671	3,640	10.4	1,428	443	2,224	4,095	7.3	2,434	1,406	3,895	7,735	8.5
Annual	8,229	9,776	16,881	34,887	100.0	15,333	9,643	30,832	55,808	100.0	23,562	19,420	47,713	90,695	100.0

Source: Direccion General de Aviacion Civil.

Table 27 identifies the proportions of cargo accommodated by mixed (passenger/cargo) flights and the proportions accommodated by full-cargo flights. The table indicates that the rapid growth of traffic in 1989 significantly changed these proportions; when cargo volumes first exploded upward in January 1989, the mixed flights (which must have had low cargo space utilization before entering the year) were able to respond immediately to the much higher levels of demand. As a result, mixed flights accommodated more than 79 percent of traffic during the first quarter of the year (in contrast to an average of less than 72 percent during 1983-1987 and just 60 percent in 1988). However, as full-cargo operators began to respond by increasing their numbers of flights, the mixed flight share of the cargo market fell rapidly until, by the final quarter of the year, the market share of mixed flights had declined to approximately 44 percent (about the proportion of the cargo market that mixed flights had served in 1981 and 1982).

As shown in Table 27, the cargo flows in two directions were nearly even for full-cargo flights, in most years of the 1981-1989 period, whereas passenger/cargo aircraft had a large imbalance of exports over imports in every year, excepting 1981 and 1988. This imbalance became exaggerated in 1989 when exports accommodated by mixed flights were nearly three times the level of imports accommodated.

During 1989, there were reports and complaints that air cargo services at La Aurora were inadequate to satisfactorily meet all demand (this was one reason for conducting GTTIS). The record of traffic growth shown in Table 27 indicates that the problems did not derive from any disinclination or disinterest on the part of the airline industry to provide adequate services; instead, the problems derived from unprecedented growth of traffic. The industry, in fact, responded well. First, the burden fell on the mixed flight operators, as full-cargo flights could not instantly be increased to meet the explosive growth that occurred in January 1989 (January 1989 cargo was 225 percent above the December 1988 level and 183 percent above the average monthly cargo volume of 1988—see Table 26). By the second quarter of 1989, full-cargo flight operators were beginning to respond well, and, by the end of the year, these operators had substantially increased their share of the La Aurora cargo market. At year end, the mixed flight operators must, once again, have had underused cargo space; during the fourth quarter they carried little more than half the level of their first quarter cargo (see Table 27).

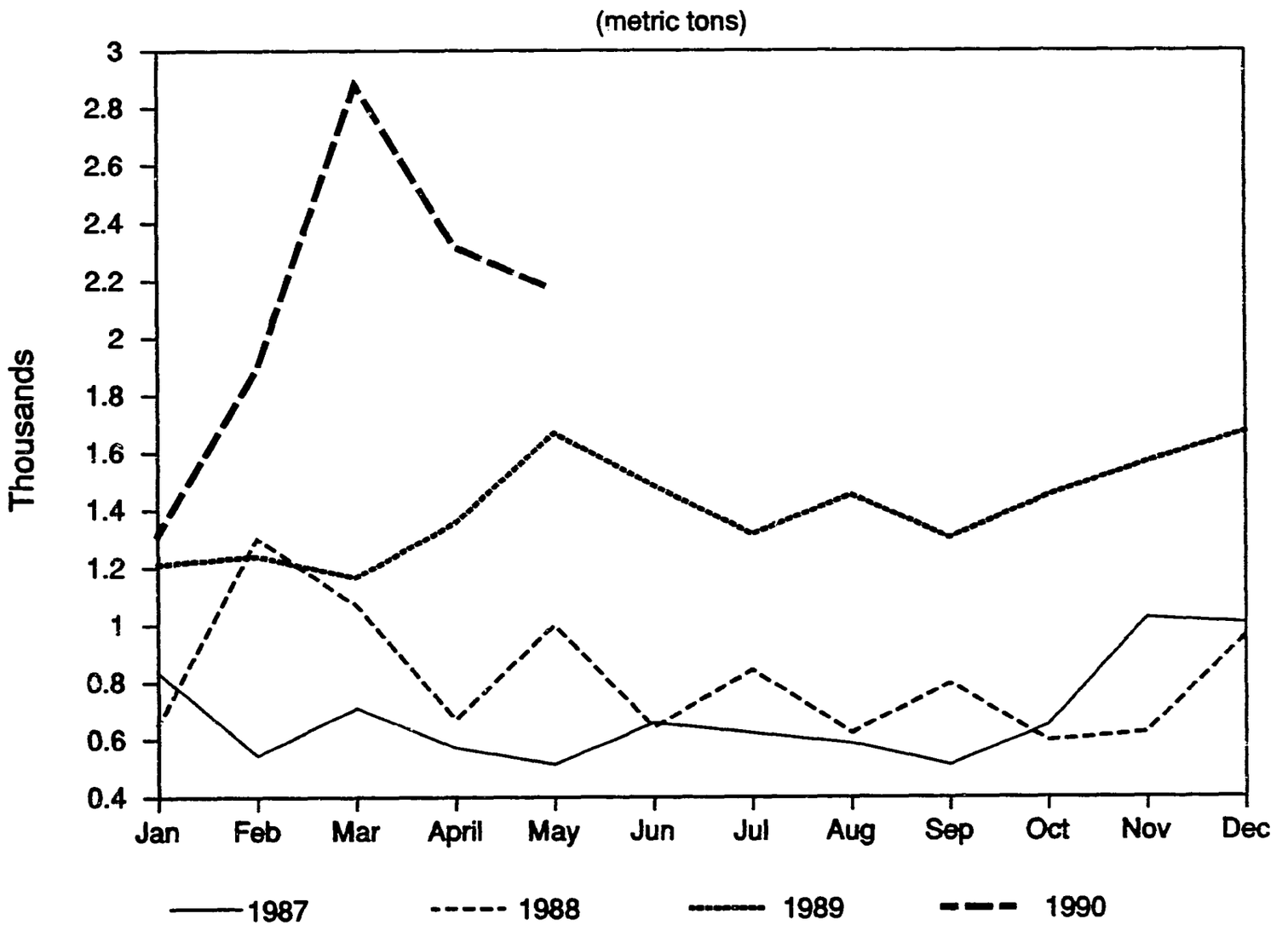
In early 1990, air cargo volumes have continued to climb. The 25,914 tons of air cargo accommodated at La Aurora during the 5 months, January to May 1990, was 31.2 percent higher than cargo traffic in the comparable period of 1989 and 168 percent above the cargo level of the comparable period of 1988. Figures 6 and 7 show, respectively, the monthly levels of air cargo imports and exports from January 1987 to May 1990. The tonnages depicted in Figures 6 and 7 for January-May 1990 are:

Table 27. International Cargo Traffic at La Aurora Airport
by Type of Service, 1981-1989

Type of Service and Direction of Cargo Flow	1981	1982	1983	1984	1985	1986	1987	1988	1989 Total	1989 Jan-March	1989 April-June	1989 July-Sept.	1989 Oct.-Dec.
Mixed Flights													
Imports (metric tons)	3,637	2,501	4,543	5,126	3,320	3,242	4,881	5,619	7,681	2,070	2,777	1,478	1,356
% of total imports	42.6	39.6	67.9	67.9	60.4	63.8	59.3	57.5	45.5	57.2	61.6	36.3	28.9
Exports (metric tons)	3,584	3,641	5,323	9,414	8,214	6,215	11,517	6,025	22,525	7,761	5,092	6,046	3,626
% of total exports	43.1	47.0	70.9	82.1	77.0	76.5	75.1	62.5	73.1	88.3	74.7	70.1	54.9
Total cargo (metric tons)	7,221	6,142	9,866	14,540	11,534	9,457	16,398	11,644	30,206	9,831	7,869	7,524	4,982
% of total cargo	42.8	43.7	69.5	76.4	71.4	71.6	69.6	60.0	63.3	79.3	69.5	59.3	44.1
Full-cargo Flights													
Imports (metric tons)	4,904	3,808	2,152	2,425	2,175	1,838	3,348	4,158	9,201	1,549	1,730	2,593	3,329
% of total imports	57.4	60.4	32.1	32.1	39.6	36.2	40.7	42.5	54.5	42.8	38.4	63.7	71.1
Exports (metric tons)	4,727	4,106	2,185	2,056	2,452	1,908	3,816	3,616	8,306	1,024	1,724	2,581	2,977
% of total exports	56.9	53.0	29.1	17.9	23.0	23.5	24.9	37.5	26.9	11.7	25.3	29.9	45.1
Total cargo (metric tons)	9,631	7,914	4,337	4,481	4,627	3,746	7,164	7,774	17,507	2,573	3,454	5,174	6,306
% of total cargo	57.2	56.3	30.5	23.6	28.6	28.4	30.4	40.0	36.7	20.7	30.5	40.7	55.9

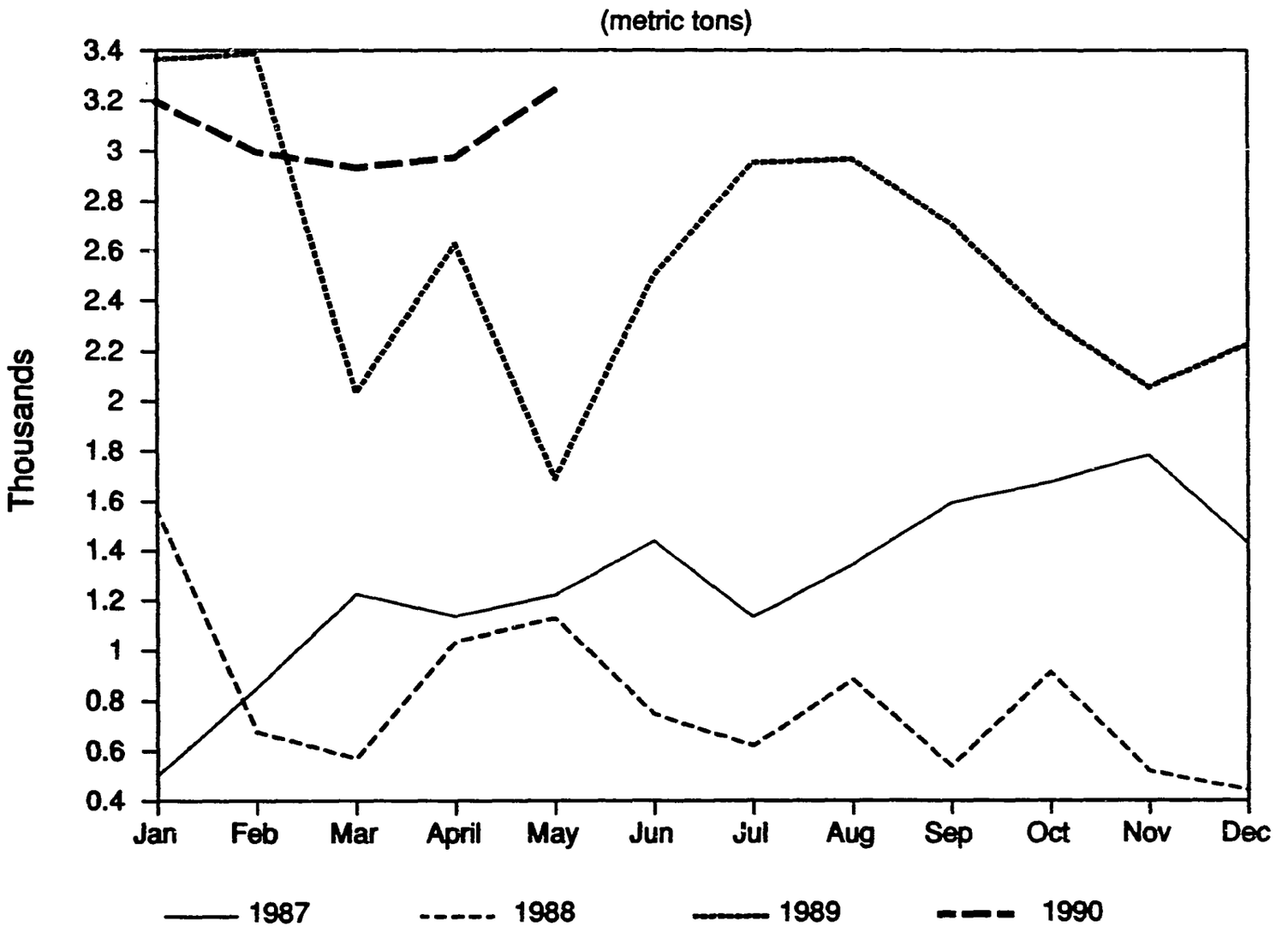
Source: Direccion General de Aviacion Civil.

Figure 6. Monthly Import Volume at La Aurora, January 1987 - May 1990



Source: Table 26 and text.

Figure 7. Monthly Export Volume at La Aurora, January 1987 - May 1990



Source: Table 26 and text.

	Imports	*Exports*
January	1,317	3,195
February	1,890	2,997
March	2,882	2,932
April	2,319	2,973
May	2,169	3,240
5-month totals	10,577	15,337

From interviews with officials of airlines and La Aurora airport, and with GREXPO and individual exporters, it appears that the problem of inadequate capacity was not a serious one, even during the first half of 1989 before the full-cargo flight operators were able to expand the number of their flights. One estimate provided to GTTIS was that, at the time that air cargo capacity was most strained, perhaps 5 percent of export cargo shipments missed their optimal flights; most of these shipments, however, were destined for the United States, and another flight the same day was therefore usually available. The situation may have been more difficlut for exports destined for Europe, and this would explain the initiation by Iberia of full-cargo flights in 1989.[1]

The situation in 1990 is good. GTTIS interviews with exporters, GREXPO, and cargo managers of several air freight companies confirmed that cargo space is plentiful and is keeping pace with the rising demand for air cargo service. Thus, cargo is rarely left on the apron for lack of space on the optimal flight, and exporters interviewed by GTTIS had never themselves experienced the problem.

Cargo shipments between Guatemala and the Unites States, especially, appear assured of adequate service. Table 28 provides a breakdown of cargo traffic among airlines and types of flight in 1987 (the most recent year for which GTTIS was able to obtain this type of information). Pan Am and Eastern serve only U.S.-Guatemala trade; AVIATECA serves mainly U.S.-Guatemala trade; and TACA, LACSA, COPA, and Mexicana participate in serving this trade. In April 1990, available cargo capacity for the U.S-Guatemala trade further increased as two new airlines, Challenge Air and Traslados, each offering only full-cargo flights, commenced operation.

GTTIS heard no complaints regarding air cargo service charges, and the rapid expansion of air cargo traffic in 1989 and early 1990 would seem to

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1. An additional problem in 1989-1990, resulting in periodic cargo servicing constraints, was the realignment of the major carriers serving Guatemala. TACA assumed control of AVIATECA and American Airlines replaced Eastern Airlines for the major route to Miami; however, the necessary adjustment period should be completed by the end of 1990.

Table 28. International Cargo at La Aurora Airport, by Type of Service and Airline, 1987

	Tons			
	Exports	Imports	Total	% of total
Mixed Flight[a]				
AVIATECA	2,621.4	673.0	3,294.4	14.0
Pan Am	2,570.4	1,743.4	4,313.8	18.3
TACA	1,556.2	185.3	1,741.5	7.4
SAHSA	449.1	359.0	808.1	3.4
COPA	164.8	21.8	186.6	0.8
LACSA	177.9	60.3	238.2	1.0
Mexicana	470.1	310.5	780.6	3.3
Iberia	1,658.9	1,173.7	2,832.6	12.0
KLM	1,076.4	309.4	1,385.8	5.9
SAM	19.2	-	19.2	0.1
Eastern	752.7	44.6	797.3	3.4
Subtotal	11,517.1	4,881.0	16,398.1	69.6
Cargo Flight[b]				
AVIATECA	3,472.9	3,122.0	6,594.9	28.0
TACA	252.0	150.7	402.7	1.7
SAHSA	37.0	36.0	73.0	0.3
COPA	53.7	39.6	93.3	0.4
Subtotal	3,815.6	3,348.3	7,163.9	30.4
Total	15,332.7	8,229.3	23,562.0	100.0
% of total	65.1	34.9	100.0	

[a] KLM indicates that, with two departures per week from La Aurora, it has capacity to accommodate 20 tons of export cargo per week. If so, then from this table it would appear that KLM was operating slightly over rated cargo capacity in the outward direction in 1987. Pan Am reports that its daily flight to Miami has capacity to accommodate 20 tons of export cargo, which would mean an annual capacity on that route alone of more than 7,000 tons of export cargo.

[b] The aircraft used most commonly for full-cargo flights from Guatemala City is the DC-8. The aircraft has a rated cargo payload of 80,000 pounds (roughly 36 metric tons), and AVIATECA uses this aircraft to perform three cargo flights per week to Miami. This would mean an annual capacity of approximately 5,600 tons of cargo in each direction.

Source: Direccion General de Aviacion Civil.

suggest that export traffic was in no way impeded by charges. Carriers, nevertheless, do not seem to compete in terms of price, at least not for scheduled services. The carriers serving the region, in fact, are mostly members of The Air Cargo Tariff (TACT), which establishes cargo tariffs by common agreement (these are periodically published). Although this collusion prevents price competition, it assures shippers of regularly scheduled and largely reliable services. In early 1990, air cargo tariffs for Guatemala-Miami service, for shipments of 500 kilograms or larger, ranged from U.S. $510 to U.S. $600 per metric ton. This is roughly four times the charge for shipping container-sized consignments by sea from Santo Tomas to the United States, which is a reasonable ratio of charges between the two modes.

Although air cargo services at La Aurora are, and have generally been, satisfactory, and service charges are reasonable, there has been a persistent and serious problem at La Aurora concerning the storage of exports. The airport has an air cargo terminal comprising two separate buildings, probably intended at one time to accommodate both imports and exports. Both buildings, however, have been used in recent years only for imports. The result has been that there is no real facility for storage of exports at the airport, and exports must be delivered on a "just-in-time" basis, and are "stored" only for a matter of hours on the apron. This operation has had the serious disadvantages of chaotic interfacing between road and air transport; occupation of an already too small apron, thereby creating difficulties for aircraft maneuvering on the apron; and deterioration of perishable commodities in the sun or the rain while awaiting transport. GTTIS understands that it has not been uncommon for goods awaiting export shipment to deteriorate significantly, causing shippers to then divert the goods to sale on the less lucrative local markets.

Action is being taken to correct this situation, however; a former customs warehouse has been turned over to a committee of airlines serving La Aurora to be developed and used for short-term storage of export cargo. It is the understanding of GTTIS that, after completion of necessary redesign and renovation, the cargo facility will be operated by the airlines. It is critical that the renovated facility contain a cold storage area. There is general agreement among the airport administration, the airlines, and the government that refrigeration must be provided at the cargo terminal; notwithstanding this general agreement, however, GTTIS was unable to obtain a definite schedule for completion of the project.

Airport Capacity Constraint

The Airport Study projected that La Aurora airport would reach 100 percent capacity utilization in 1994, thereby absolutely preventing any passenger traffic growth after that year. The study arrived at that conclusion, however, because it chose to project future growth of passenger

traffic on the basis of actual growth that had occurred from 1982 (an unusually low traffic year, with passenger volumes 27 percent lower then the average for 1979-1981), and because it presumed that La Aurora had little flexibility for spreading peak hour traffic to a wider period. The reaching of absolute passenger traffic capacity would not directly affect the growth of air cargo traffic, because additional full-cargo flights could easily be scheduled for, and accommodated during, off-peak traffic periods. A constraint on passenger travel would indirectly affect the growth of exports, however, by making more difficult the travel of Guatemalan salesman, foreign buyers, and prospective investors. In addition, the constraint, if correctly identified by the Airport Study, would directly and seriously harm the growth of the Guatemalan tourism industry.

In 1988, approximately 731,000 international passengers (combined boarding and deboarding, but excluding transit) passed through La Aurora, in addition to 24,000 domestic passengers for a total of 755,000 passengers. This level of passengers was up 21 percent from 1987 and up 72 percent from 1982. However, this figure was only 25 percent higher than the average of 1979-1981. Thus, depending on which period is measured, traffic growth could be seen as either quite rapid or rather moderate.

Because of air traffic safety considerations (the runway and taxiway are too close at La Aurora to permit simultaneous operation of the two facilities), aircraft movements should not exceed 10 or 11 aircraft per hour. With the current mix of aircraft at La Aurora (small jets represent 76 percent of total aircraft traffic), and with allowance for transit passengers, peak-hour passenger movements (boarding and deboarding) cannot far exceed 850. To determine when La Aurora is going to face serious passenger traffic constraints, it is necessary to project how traffic would grow if unconstrained and to assess the prospects for spreading out the peak period to currently off-peak hours.

The Airport Study estimated that absolute passenger capacity at La Aurora is 1.14 million passengers per annum, which represents a daily traffic level of around 3,120 passengers. This figure is only 3.67 times the current hourly capacity of the airport, and some conversion from small to medium and large jets, plus some expansion of the passenger terminal capacity could significantly increase the hourly capacity to well over 1,000. GTTIS views as incorrect the Airport Study conclusion that a costly project to relocate and reconstruct the La Aurora taxiway is urgently required. The project might not be necessary if it is desirable that Guatemala City be served by a new international airport by sometime in the year 2000-2005 period. In that case La Aurora could be retained, essentially as it now is, to serve domestic traffic, and perhaps some international full-cargo flights and regional passenger traffic.

Although GTTIS views the Airport Study as overstating the need for expanded passenger and aircraft capacity at La Aurora, GTTIS nevertheless

agrees that attention needs to be given to the impending problem to forestall its potential effects on the Guatemalan economy, which would probably begin to feel the effects in the late 1990s. A study is required, and this study might be conducted as part of the national transport planning effort scheduled to begin in 1991. The study should consider, inter alia, the following:

- The advantages to Guatemala of constructing a new international airport, capable of serving even the largest aircraft without take-off weight limitations.
- The possibilities for serving some civilian international flights at the military airport near Puerto Barrios on the Caribbean coast and perhaps also at the military airport near Puerto San Jose on the Pacific coast.
- The possibilities for expanding the use of the Flores airport (Santa Elena) to accommodate international air passenger traffic.

Domestic Air Transport Services

Currently, the only scheduled domestic air services are between Guatemala City and Flores, El Petén (La Aurora and Santa Elena airports), and there are also chartered services between these points. The Airport Study indicates that there are also about 40,000 general aviation operations per annum in Guatemala, providing connections to and among the six domestic airports and 600 or so airstrips around the country. The study indicates that recreational flying is virtually unknown in Guatemala and that general aviation flights are overwhelmingly for business purposes. The study concluded, however, that there is likely to be no significant increase in the number of general aviation flights in the future because "many of these flights were made because road conditions were bad or because telecommunication contact with other parts of the country was seriously deficient." Thus, gradually improving road conditions and expanding telecommunication facilities and services will result in general stabilization in the numbers of aviation flights followed by a decline.

Some portions of these flights, however, represent potential demand for regularly scheduled domestic air transport services, even if both the road and telecommunications networks are extensive and in good to average condition. GTTIS identified, during fairly extensive interviews in Guatemala, possible needs for domestic air services between Guatemala City and both the Puerto Barrios/Santo Tomas area and the Quezaltenango area. In the latter case, the need is to help realize potential exports now being lost

because of inadequate transport facilities and services. Domestic air services could help to reestablish Quezaltenango strawberry exports and perhaps other fruit and vegetable exports as well. These same services would also make travel easier for foreign buyers of textiles who are currently discouraged (by the travel time requirement and discomfort) from traveling to the textile-producing area of Quezaltenango. The air connection between Puerto Barrios and Guatemala City could help to stimulate foreign investment along the Caribbean coast by making it easier for potential investors to travel to and from the area. Alternatively, the military airport near Puerto Barrios could begin to serve some international flights, which would benefit La Aurora airport at Guatemala City by relieving it of traffic it will otherwise need to accommodate under increasingly congested conditions (as discussed in the preceding section of this chapter and in Appendix B).

It was not possible for GTTIS to assess the desirability of developing the military airport at Puerto Barrios, the airstrip at Quezaltenango, or any other existing or potential domestic airport or airstrip in Guatemala to accommodate domestic air transport services. It is clear from the numbers of business-related charter flights, however, as well as from some indications of existing latent demand, that significant benefits would result from the development of domestic air transport services. As such, the recommended study of future accommodation of international air transport services should be extended to consideration of needs for domestic services and to identifying optimal development of these services. GTTIS is under the impression that such an investigation will constitute a portion of the national transport planning effort scheduled to begin in 1991 with World Bank assistance.

Chapter 7

TELECOMMUNICATIONS

Introduction

The Empresa Guatemalteca de Telecommunications (GUATEL) is responsible for all public telecommunications facilities and services except that the Directorate of Posts and Telegraph has responsibility for telegraph services. Both of these organizations report to the MCTOP. GUATEL must obtain government approval of any changes in the structure and levels of its tariffs for services rendered, and government approval is required as well for GUATEL investment plans. Otherwise, GUATEL is largely free to make its own telecommunications system development policy and any internal changes, such as in its organizational structure and staffing.

Inadequate telecommunications, like inadequate transportation, can impede economic growth. GTTIS was concerned with the possibility that a limited telecommunications network, poor maintenance of the network that does exist, poor service quality, and pricing policies might be either directly or indirectly, adversely affecting investment levels in Guatemala nationwide or in some of its regions; such policies might also reduce trading opportunities, thereby slowing export growth. The investigation into these matters by GTTIS was very brief, and GTTIS was not able to quantify economic effects. Nevertheless some policy adjustments appear desirable in the area of telecommunications; more complete analyses are needed, however, to reach firm conclusions on these matters of policy.

GTTIS examined the existing telecommunications system and services and GUATEL plans and proposals for improving the system. Issues of the telecommunications sector were identified and assessed, including pricing policy. Service pricing policy was examined to identify possible adverse effects of the policy and desirable adjustment possibilities. These GTTIS surveys and assessments of the Guatemalan telecommunications sector are discussed in the following sections of this chapter.

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Existing Telecommunications System

The Guatemalan telecommunications system is currently inadequate for the country's needs. Service is concentrated in the greater Guatemala City metropolitan area, which has 80 percent of the country's telephones and slightly more than 60 percent of public pay phones. All of the 22 departments of the country, other than the Guatemala City area, have at least some telephones, but more than 40 percent of Guatemala's 304 municipalities have no telephones, and another 20 percent have no private telephones and just one or a few public telephones. Of a total of 158,000 telephones at the end of 1989, 65 percent, or slightly more than 100,000, were residential and the remaining approximately 55,000 were commercial, including government telephones.

Although the telecommunications system is quite limited and does not meet even one-half of demand, GUATEL made significant progress in 1989 in expanding the system; the number of working telephones nationwide was increased from approximately 138,000 at the beginning of the year to 158,000 by the end of the year. With a population of 8.7 million, the latter figure represents slightly more than 1.8 telephones per 100 inhabitants. In 1989, also, the number of public pay phones increased from 1,120 to 2,120, the latter still a small number for a national total, and the number of telex lines increased from 1,373 to 1,873. Before 1989, telephones were predominantly analog, but 1989 installations (and all planned installations) are based on digital switching and microwave and fiber optics.

Not only is the Guatemalan telecommunications system currently limited in extent, but the system provides poor service quality. Two measurements of service quality are (1) the time required to complete a call (that is, the time required for a caller to obtain a dial tone, to dial, and for the telephone to be answered at the other end of the line) and (2) the proportion of calls that are completed. In 1988, a study was commissioned by the Asociation de Gerentes de Guatemala (Manager's Association of Guatemala) to determine the average call completion time in Guatemala. The consultants (Aragon y Asociados, a Guatemalan firm) determined that the average time required to complete a call was 23 minutes, and roughly one-third of all calls required more than 30 minutes to complete.

Regarding call completion rates, GUATEL does not record the completion rates of outgoing calls, but 88 percent of international calls are between Guatemala and the United States, and AT&T records the completion rates of calls made to Guatemala. A well-functioning system should have a call completion rate of 70 percent or above, and the average for calls from the United States to Guatemala in 1989 was approximately 37 percent. This low average was not the result of busy international circuits, but was caused by local system congestion, which is especially serious in Guatemala City. Guatemala has an adequate number of international circuits; only rarely (less

than 5 percent of the time) are all of the international circuits into Guatemala busy. Table 29 provides AT&T information on call completion percentages and busy international circuits for all of the countries of Central America. As can be seen from Table 29, Guatemala calls had a slightly better completion rate than calls to El Salvador, Nicaragua, and Honduras, but Guatemala experiences the worst local congestion of any Central American country.

Planned System Development

The advances made by GUATEL in 1989 in developing the telecommunications systems actually represented delayed implementation of what was originally intended to be GUATEL's 1984-1987 investment program, financially assisted by the World Bank and the InterAmerican Development Bank. The program provides for expansion of local exchange capacity by 109,800 lines, of which 79,000 lines are being installed in Guatemala City; installation of 3,500 additional public pay telephones; extension of telephone services to about 300 rural communities; and installation of a new international exchange in Guatemala City. The program is continuing and is expected to be completed by the end of the year.

After awaiting approval by Congress for more than a year, another investment program is about to get under way. This program, financed by Japan, will add 50,000 lines in northern and central Guatemala City, areas that had been left out of the ongoing (1984-1987) program. Yet another, and much larger program, is planned—a program that would add 300,000 additional lines to the entire system, of which 250,000 lines would be in Guatemala City and the other 50,000 lines would be installed in other areas of Guatemala. GTTIS might have been skeptical of this third program being implemented in the short term except that the government has gone to the extraordinary length of issuing an emergency decree to allow GUATEL to allocate six "lots" of installations among six different manufacturers. The reason for doing this, of course, was to substantially reduce the implementation period for the product, largely by eliminating the delay in program approval. The manufacturers had already been selected at the time of the conduct of the GTTIS (March-April, 1990), and final presentation to and approval from Congress was expected before the end of May. All of the manufacturers were offering financing for their portions of the overall program.

The six participants are Siemens of West Germany (switching systems for Guatemala City), Ericson of Sweden (switching systems for Guatemala City), AT&T of the United States (outside plant cable and fixtures), NEC of Japan (transmission systems), Italtel of Italy (switching systems in towns outside of Guatemala City), and Alcatel of France (expansion of international switching and earth station facilities). GUATEL used its best judgment to select the best manufacturers for different sectors of the expansion project.

Table 29. Completion Rates of Telephone Calls from the United States to Countries of Central America, 1989

Country	Percentages					
	Completed Calls as Proportion of Total Calls	Uncompleted Calls as Proportion of Total Calls	All International Circuits Busy[a]		Congestion of Local System	
			Proportion of Total Calls	Proportion of Uncompleted Calls	Proportion of Total Calls	Proportion of Uncompleted Calls
Belize	52.6	47.4	0.0	0.0	47.4	100.0
Costa Rica	56.1	43.9	1.4	3.2	42.5	96.8
El Salvador	34.7	65.3	10.0	15.3	55.3	84.7
Guatemala	36.8	63.2	4.8	7.6	58.4	92.4
Honduras	32.7	67.3	27.2	40.4	40.1	59.6
Nicaragua	32.8	67.2	69.2	103.0[b]	0.0	0.0
Panama	52.6	47.4	10.4	21.9	37.0	78.1

Note: Monthly averages.
[a]February 1990 data.
[b]Not possible, and undoubtedly because data on international circuits are for February 1990, whereas data on completed calls are for 1989. The two sets of data suggest that telephone services to Nicaragua deteriorated from the average for 1989 to February 1990.
Source: AT&T

GUATEL's additional expansion plans are in rural telecommunications, international services, and data communications. Using $18 million financed by the InterAmerican Development Bank, GUATEL is implementing a $30 million expansion project for the third phase of its plan for rural telephone services to more than 300 cities, towns, and villages. GUATEL also has plans for installing digital modems in its current earth station to provide digital services at reduced costs. It is also expected that new business services, such as INTELSAT's International Business Service will be provided. Plans also exist for a new earth station by the year 1995. Finally, the data network via Mayapaq will be expanded and will include international services via Telenet's network. Telenet is a subsidiary of U.S. Sprint, a United States-based telecommunications company.

The expansion plans just described should do a great deal toward bringing the supply of telephone services more closely in line with demand. In the past, prospective subscribers have had to wait long periods, frequently running to several years, to have telephones installed. By 1995, when all of the current projects have been implemented, the total number of telephones in operation will have risen to slightly more than 500,000. Although the various ongoing and approved GUATEL programs are mainly for Guatemala City (379,000 telephones out of 459,800), the programs will nevertheless be providing some services to all of the 304 municipalities in Guatemala, including 462 settlements with populations of more than 1,000 and frontier settlements and places of tourist interest. Not only are the numbers of telephones being appreciably increased within a relatively brief period, but the quality of service will be much improved. All of the programs are designed to provide Guatemala with more cost-effective, reliable, and varied services, leading to the long-term development of an Integrated Services Digital Network (ISDN), rapidly becoming the worldwide goal and standard in the area of telecommunications. Figure 8 indicates how telephone line installations are expected (by GUATEL) to increase during the 1990-1994 period. In the view of GTTIS, the projection is somewhat overly optimistic, and a more realistic expectation might be a 5-year period of implementation after commencement of work.

Guatemala's neighbors are also undertaking major telecommunications systems development programs. Mexico has the most ambitious program of all, as the country is in the process of expanding its telephone system by more than 10 million lines from 1988 to 1995, which will raise its telephone density from about 4 telephones to more than 14 telephones per 100 inhabitants. Guatemala, even after completion of its own ambitious telecommunications development program will, in 1995, have only 5.5 lines per 100 inhabitants, which will be significantly better than some of its neighbors, however. Figure 9 shows the actual 1988 telephone line densities and projected 1995 densities for five Central American countries, Colombia, and Mexico.

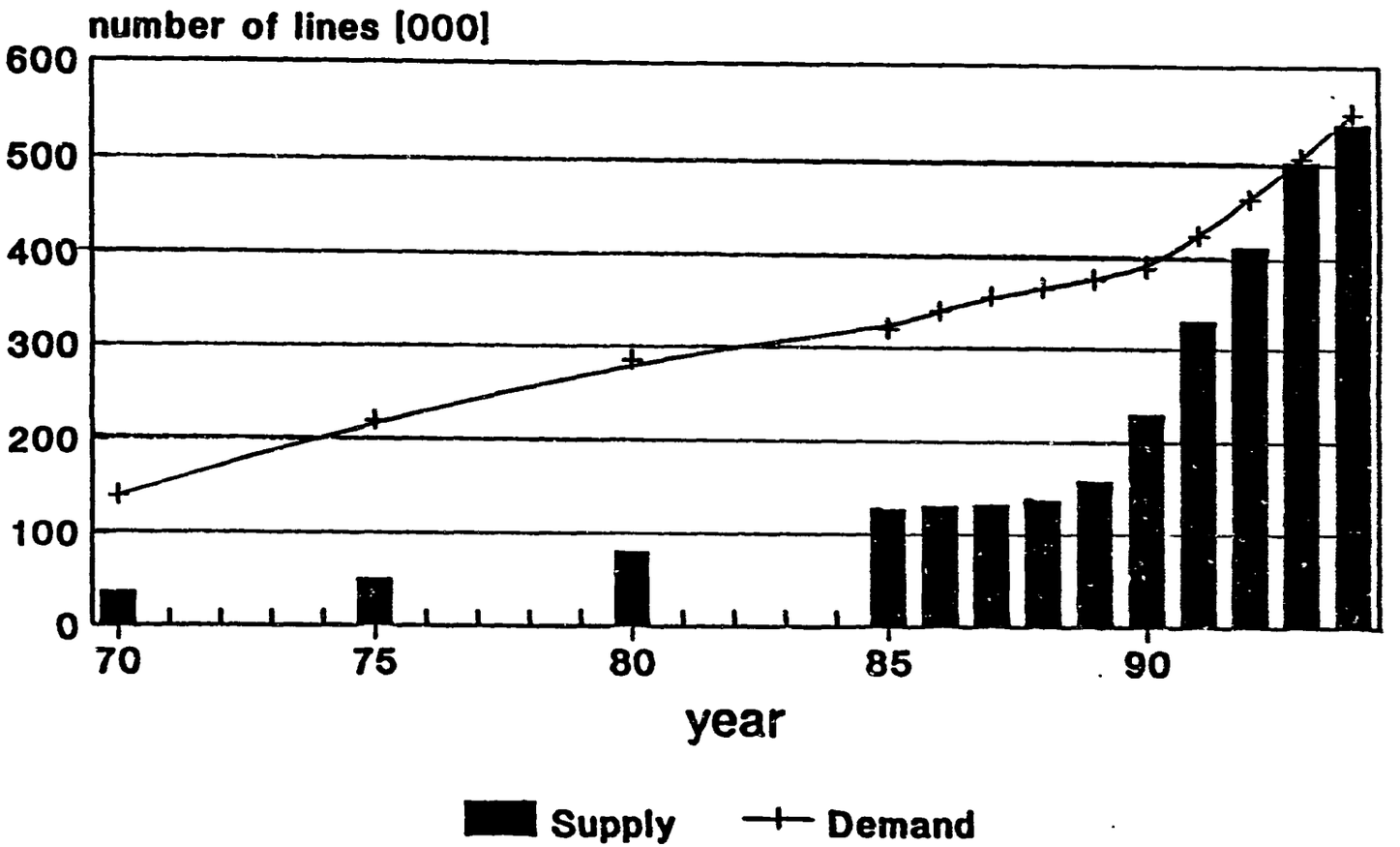

Figure 8. Demand Versus Supply of Telephone Lines in Guatemala (Source: GUATEL)

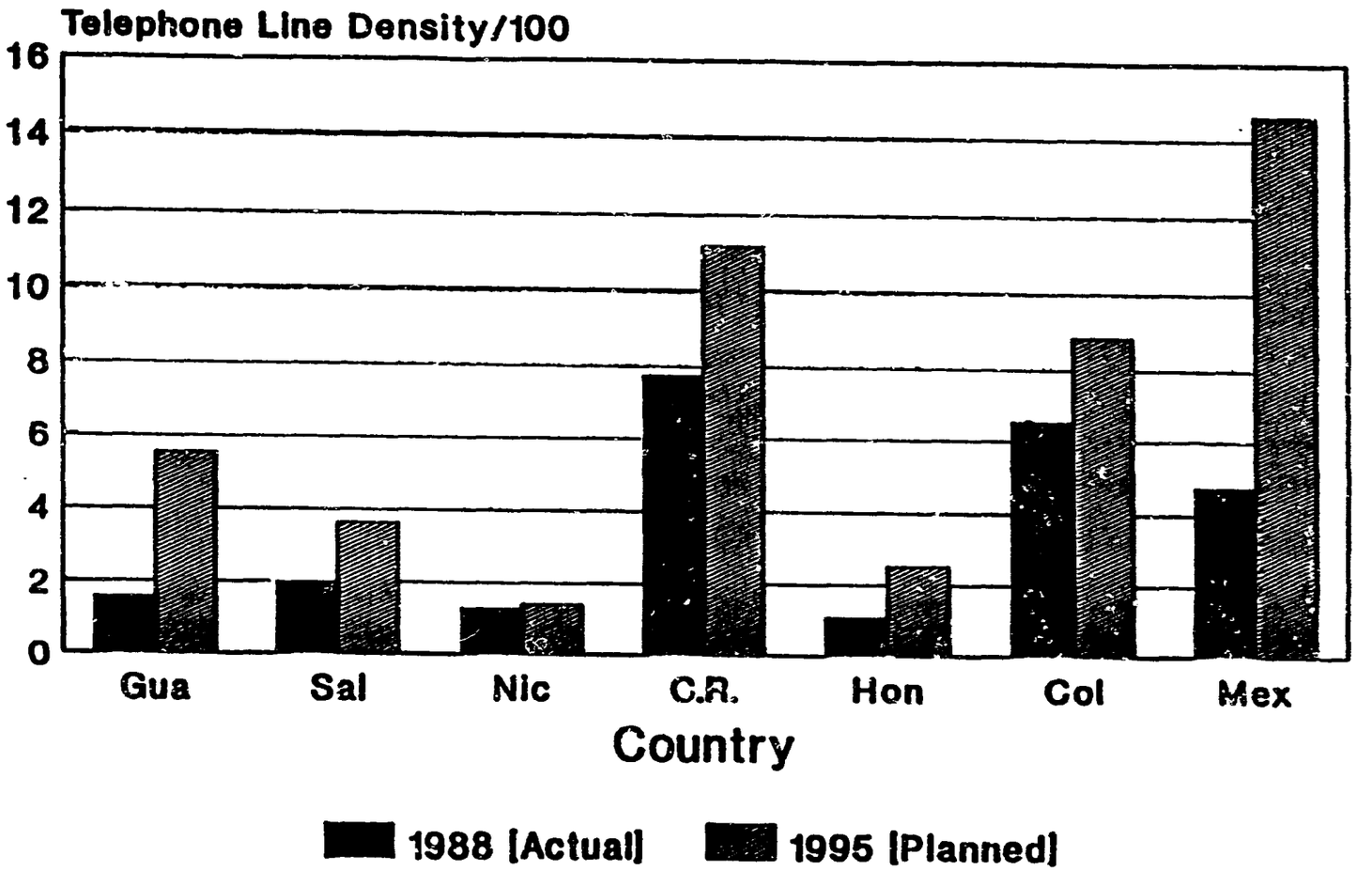

Figure 9. Telephone Line Density per Country

Telecommunications Sector Issues

GTTIS identified three issues in the telecommunication sector that deserve discussion here and subsequent discussion within the government: (1) development emphasis, (2) GUATEL autonomy, and (3) service pricing policy. These issues are discussed in the remaining paragraphs of this chapter.

Development Emphasis

At present and in 1995, about 80 percent of the Guatemalan telecommunications system is and will be located in Guatemala City. The incremental economic value of adding additional telephones to Guatemala City after 1995 (or even at present) is likely to be much lower than the value of expanding facilities and services in other areas of Guatemala. As indicated in Chapter 6, the recently conducted Airport Study identified a current level of 40,000 general aviation flights per year in Guatemala, mostly business-related trips. The Airport Study surmises that many of these trips would be unnecessary, if the telephone system were adequately developed throughout the country. Such travel (by small, chartered aircraft) is costly, and the passenger time value is also high, so that in economic terms, if not in financial terms, development of telecommunications facilities and services outside of the Guatemala City area could be highly rewarding to the country (but less so to GUATEL).

Much more is at stake than the prospect of transport cost savings. Despite the level of 40,000 general aviation flights per year, there are undoubtedly many business contacts that are not made because of the difficulty and time required in making them, and there are areas of the country that are rarely, if ever, visited by businessmen and government officials. These contacts, if made either through travel or through telecommunications, are essential for maximizing economic and export growth and for full integration of all geographic areas of Guatemala into the national economy. [The air transport study being recommended by GTTIS (see discussion in Chapter 6) would provide insight into the potential for converting charter flight passengers to reliance on an improved telecommunications system, and would also attempt to identify latent demand for internal travel and communications for business purposes.]

In a regional development context, it may also be undesirable to concentrate telecommunications development (and other infrastructure development) in a single urban area. Guatemala, which is at an earlier stage of economic development than Mexico, has time to avoid the developmental mistakes that have led to the crisis situation now represented by the Mexico City metropolitan area. This regional development consideration is much broader than GTTIS could fully take into account, and the observation here is merely that the Government of Guatemala should be clear in its regional

development goals when designing telecommunications (and other infrastructure) development programs.

GUATEL Autonomy

The question of the optimal degree of GUATEL autonomy may be less important at present than it has been in the past or will be in the future. This is because, in 1990, the government has made an extraordinary effort to momentarily reduce its interference with GUATEL development planning, and GUATEL has reduced the need for development flexibility at present because its development program is set for this year and the next few years. The principal arguments for and against greater GUATEL autonomy in the short to medium term are as follows:

- Past government interference with GUATEL development planning and implementation has caused undesirable delay in completing telecommunications investment programs. Interference also occurs in routine acquisitions, such as vehicle tires, as a result of the Law of Purchase and Contracts (Ley de Compras y Contrataciones), which applies to GUATEL and other parastatal enterprises and specifies a complex series of steps before approval of even routine purchases can be given. GUATEL is also not helped by the requirement that all of its foreign exchange earnings must be turned over to the Bank of Guatemala (during a period of declining value of the quetzal the requirement to turn over all foreign exchange earnings has been costly for GUATEL because the company has often had to buy back exchange revenue at prices in terms of quetzales that were higher than what the company had received when turning over foreign exchange revenue).

- Considering the need to expand telecommunications facilities and services into all areas of Guatemala, and the low initial financial returns that can be expected by GUATEL from some of these development efforts, it is not clear that it would be economically desirable for Guatemala to give GUATEL sole authority over design and prioritization of its future development efforts.

In the view of GTTIS, it is desirable to limit government overseeing of, and interference with, GUATEL planning, program implementation, and operation to the following:

- Policy guidelines agreed on between the executive and legislative arms of the government. These guidelines would relate to areas (geographic and commercial) of development emphasis and bases for establishing and adjusting installation fees and user charges.

- Review by the MCTOP of proposed GUATEL investment programs and proposed installation fee and user charge adjustments to ensure that they are in line with pertinent government guidelines.

- Monitoring by MCTOP of GUATEL operations, financial results and progress in program implementation, and discussion with GUATEL management whenever problems appear.

Otherwise GUATEL, which requires no subsidization by government, should be free to prepare its own capital and recurrent budgets, without any need to obtain government approval, and it should be permitted to carry out its procurement programs without interference from government. Retention of foreign exchange earnings is a broader issue than GUATEL, but from the standpoint of cost minimization, it would be helpful if government would permit organizations such as GUATEL, which have heavy and continuous import requirements, to retain all or some significant portions of their foreign exchange earnings.

The government is considering the possibility of privatizing GUATEL, as Mexico's telecommunications entity has been privatized. In the view of GTTIS, privatization is not essential if, as discussed earlier, steps are taken to make GUATEL largely autonomous. An option under consideration by the government is greater involvement of the private sector to provide some specialized telecommunications services and to carry out much of the GUATEL construction and installation program and perhaps become involved in system maintenance efforts as well. This approach, whereby GUATEL remains within the public sector, but increasingly contracts work out to the private sector, appears to GTTIS to be a good approach to the future of the telecommunications sector.

Pricing Policy

Congestion of the existing telephone network can be at least partly ascribed to the low charges for domestic telephone calls; a 1988 World Bank report indicates that domestic charges had not been adjusted at that time since 1978, and the charges for a residential subscriber were equivalent to 0.5 U.S. cent per local call (135 seconds) for the first 400 calls, and 1 U.S. cent per call thereafter. Business subscribers pay three times the residential rate for the first 400 calls, and twice the residential rate for additional calls. Meanwhile the government has been approving large increases in international telephone charges so that charges for calls from Guatemala to the United States are now 3 to 4 times as high as charges for calls from the United States to Guatemala.

Whereas subscribers pay low user charges in Guatemala, they pay a high fee for telephone installation; the fee in early 1990 was roughly 2600 quetzales for installation of a residential line. Referring to Figure 8, if GUATEL has been measuring demand for telephone lines on the basis of the numbers of applicants at an installation fee level of 2600 quetzales, then the total demand for telephones at some more reasonable installation fee could be considerably higher. Until now there has been a certain logic to dampening demand for telephones through excessively high installation fees, because GUATEL could only begin to meet demand in any case. Future policy for telephone installation fees and user tariffs might desirably be a reversal of the current situation; that is, installation of a telephone should increasingly be looked at as a basic right of the Guatemalan household or business, and installation fees should thereafter be held low; but moderate use rather than unrestrained use should be encouraged, through use tariffs that cover all costs other than installation.

GTTIS could find no evidence that the high charges for international telecommunications services significantly impede export or investment growth. On the other hand, excessively high charges undoubtedly do deter demand for international services below what would be optimal from the standpoint of relationship to costs. It is desirable that a reassessment be made by the government, the MCTOP, and GUATEL of the desirability of adjusting the relative levels of telephone installation fees, domestic service user tariffs, and international service user tariffs.

Chapter 8

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Findings

GTTIS was primarily concerned with the possibilities that inadequate transportation and telecommunications facilities and services might be significantly impeding the growth of exports and investment in Guatemala. The general conclusions of GTTIS in this regard are the following:

- Guatemala's international transport facilities and the international services provided there do not appear to have significantly impeded the growth of Guatemalan exports; however, some cost reductions are possible, particularly in shifting some cargoes to Puerto Quetzal from Puerto Santo Tomas, and any cost reductions can be expected to have at least limited positive effects on levels of exports.

- Guatemala's exporter associations, CUTRIGUA and GREXPO, are already playing significant roles in helping to develop the Guatemalan export sector. However, the associations still must concern themselves with self-development to compete effectively with the export sectors of principal competitor countries, Costa Rica and Colombia. CUTRIGUA and GREXPO could play increasingly important roles in ensuring that transport and storage facilities and services are adequate to support future potential export growth.

- The chief policy issue facing the Guatemalan transportation sector is the extent to which the private sector will be permitted to assist in desirable

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improvement of operations at Guatemala's seaports and international airport and, conversely, the extent to which labor concerns will be permitted to impede progress toward improvement of operations at these facilities.

Specific findings of GTTIS with regard to current and impending problems of the transportation and telecommunications sectors and the needs to take action to correct or forestall such problems are the following:

- Road conditions, generally, are not good in Guatemala, and increased attention to road maintenance and rehabilitation is needed. Design standards for heavily trafficked roads should be modified to reduce degradation. An ongoing project, financed by the World Bank, should result in significant improvement of the average condition of Guatemalan roads.

- There does not appear to be a need for extensive new road construction, but the new road between Escuintla and Puerto Quetzal remains incomplete for want of just four or five bridges, with no ongoing construction activities.

- Railway use will remain limited except perhaps in the long run. Subsidization of services should end to ensure economically optimal modal choice.

- With improved access, Puerto Quetzal could play a much more important role in the transport sector of Guatemala, and significant volumes of cargo are expected to divert from Santo Tomas to Puerto Quetzal almost as soon as Puerto Quetzal has been provided with improved access.

- Cargo handling of Puerto Quetzal is inefficient, particularly for break bulk cargo, i.e., sugar. Cargo handling equipment acquired for Puerto Quetzal was poorly selected: cranes obtained for handling containers are mismatched and bulk-handling equipment to accommodate sugar, wheat, and fertilizers is inappropriate.

- Cargo handling efficiency at Santo Tomas may be even worse than at Puerto Quetzal, especially since it has been institutionalized, with three unions

representing a substantially overlarge force of government labor.

- Cargo storage at Santo Tomas is chaotic, and storage periods can exceed a year. Storage on the quay adversely affects cargo handling.

- Significant congestion is beginning to occur at Santo Tomas, but the outlook is for reduced volumes of traffic at the port because of traffic diversion to Puerto Quetzal and Puerto Barrios. Congestion at Santo Tomas could be further reduced through improved cargo handling efficiency, partly achievable through the imposition of penalty charges for overly long storage periods and improperly stored cargo. An ongoing study of port operations should help improve cargo storage and handling at the port.

- FEGUA and BANDEGUA have reached an agreement on the modernization of Puerto Barrios, which is expected to accommodate most or all banana exports after redevelopment.

- Neither the ports nor La Aurora airport at Guatemala City have cold storage facilities. This lack of appropriate storage must have discouraged to some extent the growth of perishable commodity exports (which, nevertheless, have expanded rapidly), and at least limited value losses have occurred due to perishable commodity deterioration and some spoilage.

- International shipping services are adequate at Santo Tomas, and charges are reasonable, but liner shipping services are needed at Puerto Quetzal. Improved access to Puerto Quetzal should result in increased volumes of traffic at that port, which should, in turn, induce shipping lines to initiate liner services.

- International air transport services at La Aurora were not quite adequate to accommodate explosive growth of air cargo volumes in early 1989, but the airlines quickly responded by expanding services, especially by increasing the numbers of full-cargo flights offered. Capacity in 1990 is more than adequate to accommodate the continuing growth of air cargo volumes.

- La Aurora has an impending international passenger capacity problem that should be forestalled before it becomes serious. One possibility of forestalling the problem is to relocate the airport taxiway, which currently is too close to the runway for safe operation of both facilities simultaneously.

- Currently scheduled domestic air transport services are limited to the Guatemala City-Flores route. Each year, 40,000 general aviation flights serve the 6 domestic airports and approximately 600 airstrips. New scheduled services are probably needed, such as between Guatemala City and both Quezaltenango and Puerto Barrios/Santo Tomas. Five Guatemalan airliners now operate, all of which might provide expanded domestic services.

- Telecommunications facilities and services have been wholly inadequate nationwide, but programs under way or about to get under way should bring the telephone system in the Guatemala City area up to a fairly good standard. Much less emphasis is placed on improving telecommunications elsewhere in Guatemala. Current programs might be optimal or nearly so from the standpoint of improving the financial outlook for GUATEL, but they probably are not economically optimal, in terms of stimulating increased investment and exports.

- GUATEL requires greater autonomy if potential effectiveness and efficiency gains are to be realized. Increasing cooperation with, and reliance upon, the private sector may also help GUATEL in achieving greater efficiency.

- Current telecommunications pricing policy tends to dampen demand for telephones and places unnecessary and probably undesirable restraint on the use of international telecommunications services, while encouraging uneconomic levels of domestic use.

Recommendations

GTTIS is primarily concerned with needs to improve air and sea transportation and telecommunications services. Table 30 presents, in summary fashion, GTTIS recommendations for improving these services,

prioritizing four major efforts. These efforts and the logic for establishing priorities are briefly discussed in the remaining paragraphs of this chapter.

Puerto Quetzal Development

Over a period of more than a decade, the Government of Guatemala has invested in excess of U.S. $100 million to develop the new port of Quetzal and provide it with good access. Nevertheless, 7 years after the port opened to traffic it still does not have adequate access, and, as a result, it is underutilized. The port remains largely a two-commodity port—sugar exports and fertilizers imports—even though most coffee is grown in western Guatemala and Puerto Quetzal is only about 120 kilometers from Guatemala City. Port choice for exports, of course, also depends on destination. In the case of U.S.-Guatemalan trade, U.S. ports on the gulf, east, or west coasts might be used; GTTIS did not obtain sufficient information to identify just what the split would be among these ports, with full development of Puerto Quetzal, but discussions with CUTRIGUA suggest that a significant portion of cargoes now being served in gulf ports could be better served in U.S. west coast ports. Besides the port access improvement, it is quite important that cargo handling be improved at Puerto Quetzal, especially the handling of sugar. Having been stung once in acquiring incorrect equipment for the port, port administration may not be very inclined to order new equipment. GTTIS suggests that the private sector could provide aid in the development of dedicated berths, with the requisite equipment, and enter into build-operate-transfer (BOT) agreements of 15 years' duration.

Caribbean Port Development

FEGUA and BANDEGUA have already reached an agreement for the redevelopment and operation by BANDEGUA of the once important port of Barrios. To recover development and operations costs, BANDEGUA will probably be willing to accommodate COBIGUA bananas, in addition to its own. Between this shift of banana traffic to Puerto Barrios and some shift of traffic to Puerto Quetzal, the port of Santo Tomas should be relieved of its incipient congestion. Nevertheless, improvements are needed at the port of Santo Tomas to reduce costs. For the most part, the necessary changes are technically easy but politically difficult: the labor force should be sharply reduced; the port should be operated for 24-hours a day; work rules should be revised; penalty charges for overly long and improper storage should be imposed and enforced; and the private sector should be brought into the port improvement process to develop and operate a container terminal and a cold storage facility.

Telecommunications System Improvement

Expansion and improvement of the telecommunications system is under way with three GUATEL programs that will install a combined 459,800

Table 30. Recommendations for Improvement of the Transportation and Telecommunications Sectors of Guatemala

Economic goal	Transportation objective	Measure or program	Sector priority	Critical components and subcomponents	Actions and actors	Status and issues
Stimulation of western Guatemala export growth through improved profitability	Minimization of shipping costs for exports of western Guatemala	Continuation of Puerto Quetzal development	1	Improvement of port access	Completion of bridges along new Escuintla-Puerto Quetzal road. MCTOP to give this project top priority	Construction of bridges was not yet under way during conduct of GTTIS.
				Improvement of cargo handling		
				Redevelopment of bulk sugar terminal	Agreement between MCTOP, Puerto Quetzal administration and sugar growers, millers and refiners to develop appropriate bulk terminal for sugar	This does not yet appear to be under discussion. Labor at the port, although under contract and theoretically easily reducible, may be the impediment to early implementation.
				Development of a container terminal		At present such a terminal is not yet needed at the port, but improvement of port access can be expected to significantly increase containerized traffic as a result of diversion from Santo Tomas.
					Agreement should be reached between MCTOP and port administration, on the one hand, and GREXPO and CUTRIGUA, on the other, for private ooperator development and operation	As above, current labor force could impede development.
				Provision of cold storage area	Agreement between Puerto Quetzal and GREXPO and CUTRIGUA on storage facility	Not yet under discussion.

Table 30 (continued)

Economic goal	Transportation objective	Measure or program	Sector priority	Critical components and subcomponents	Actions and actors	Status and issues
Stimulation of eastern Guatemala export growth through improved profitability	Minimization of shipping costs for exports of eastern and northern Guatemala	Improvement of Caribbean port operations	2	Rationalization of port use Diversion of western Guatemala cargoes to Puerto Quetzal (see Sector Priority 1, above)		
				Diversion of banana traffic from Santo Tomas to Puerto Barrios.	Rehabilitation of Puerto Barrios by BANDEGUA, and improvement of 10-km Santo Tomas-Puerto Barrios link road. MCTOP to undertake road project.	Agreement has been reached between FEGUA and BANDEGUA on Puerto Barrios rehabilitation. There is not yet any road reconstruction project scheduled.
				Improvement of Cargo handling Revise work rules, staff, and hours of operation.	Agreement among EPNSTC and labor unions.	Study under way to identify modifications in work rules, labor requirements, and hours. However, labor resistance to staff retrenchment could prove to be an intractable problem.
				Development of a container terminal.	As for Puerto Quetzal, agreement is needed between EPNSTC and private groups, particularly GREXPO and CUTRIGUA, for private operator development and operation	As above, current labor force could impede development.
				Provision of cold storage area	Agreement between EPNSTC and GREXPO and CUTRIGUA on storage facility.	Not yet under discussion
Improved integration of all areas of Guatemala into the national economy	Reduction of transport needs to accomplish economic and social purposes	Expansion and improvement of telecommunications system	3	Optimization of system development Set policy on development priorities	Executive and congressional branches to provide guidelines	So far, programs are designed by GUATEL and responded to by government. No general guidelines provided.
				Implementation of programs	GUATEL to implement. Decisions needed on the degree of autonomy GUATEL will have for design and implementation.	Progress is quickening, and substantial improvement is foreseen for 1990-1995 period, but current extent of government interference with GUATEL could result in significant delays.

Table 30 (continued)

Economic goal	Transportation objective	Measure or program	Sector priority	Critical components and subcomponents	Actions and actors	Status and issues
				Optimization of system use	Review of pricing policy by government and GUATEL, and adjustments as warranted	Review not scheduled
Improved integration of all areas of Guatemala into the national economy.	Improved access to remote areas	Improvement of air transport services	4	Development of domestic services Airport development	Agreement of MCTOP, Congress, and the army to develop domestic air transport services, and use military airports for some civilian flights	Study of potential role of domestic air services required. Planned national transport planning effort (scheduled for 1991 start-up) expected to include this investigation.
Maximization of private investment.	Continuing accommodation of international air transport demand			Establishment of domestic services	Guatemala already has one public sector and four private sector airlines; it should be possible for all or some of these airlines to institute new domestic services as airport facilities become available for the accommodation of such services.	There are already 40,000 general aviation flights per year in Guatemala, and it should not be especially difficult to move from these operations to greater reliance on scheduled services.
				Avoidance of international service constraints		
				Cargo terminal development of La Aurora	Agreement of MCTOP, airport administration, and airlines for development of terminal by airlines	Agreement reached and project implementation under way.
				Relief of passenger accommodation constraint	Agreement of MCTOP, Congress, and army to develop new airport, convert military airport(s) to partial use by civilian aviation and/or improvement of La Aurora.	Study required in near term. Probably to be incorporated within upcoming national transport planning effort.

telephone lines, of which 379,000 (82.4 percent of the total) was being installed in the Guatemala City metropolitan area. GUATEL will do well if all these programs can be implemented by 1995, and GTTIS, therefore, is not recommending consideration of any incremental development effort from 1990 through 1995. It is the view of GTTIS, however, that any telecommunications development program designed on the basis of economics, concerns of social welfare, and environmental considerations, rather than purely on the basis of prospective financial returns, would be much more regionally balanced than the combined program about to be implemented. The principal potential advantage of retaining GUATEL within the public sector is, as GTTIS sees it, that the enterprise might then be expected to give economics and social and environmental concerns greater emphasis than would a private company. GTTIS raises this issue not to alter current plans, but in the hope that development beyond 1995 will be designed to achieve maximum economic returns through emphasizing the potential role of telecommunications in promoting full integration of all geographic areas into the national economy, and, in so doing, also achieving social and environmental objectives.

Far from wishing to interfere with GUATEL program implementation, GTTIS is recommending herein that the autonomy of GUATEL be significantly increased to enable the organization to implement programs with fewer impediments. Once the government has approved investment programs, it seems an unnecessary hindrance to program implementation to also require clearances of annual recurrent and capital budgets and even of individual items for procurement.

Finally, GTTIS recommends that the government re-examine the firm's telecommunication services pricing policy. Currently demand is dampened by high installation costs (which is undesirable from the standpoint of providing widely ready access to the system); domestic use is encouraged by below-cost tariffs (which is undesirable from the standpoint of system operation because considerable congestion results from the encouragement of high use per marginal, as well as more important, purposes); and international use is discouraged by considerably-above-cost tariffs (which is undesirable because of the linkages of such use to international trade and investment).

Air Transport Service Improvement

GTTIS ranked this effort as fourth in priority because international air transport services are already adequate, and it is not clear, without more thorough study than could be done by GTTIS, what potential benefits might derive from efforts to develop domestic air transport services. If nothing is done about this subsector for a few years, however, the need to improve air transportation might take on a much greater importance, as traffic capacity constraints might begin to be felt at La Aurora by 1995 or soon thereafter.

Appendix A

STUDY OF TRANSPORTATION AND COMMUNICATION INFRASTRUCTURE

Scope of Work

Background

An important aspect of the Economic Support Program for FY90 is the initiation of discussions with the GOG's economic team on sector-specific issues. Such discussions will address concerns that either policies or infrastructural limitations have created transportation and communication bottlenecks that impede economic growth. However, there is little information available on the extent to which such bottlenecks exists or, if they exist, that they pose a more binding constraint than in other countries.

To the extent that policy restrictions can be identified, the discussions pursuant to the ESF grant will focus on the elimination of such limitations. If infrastructural restrictions exist, discussions will be pursued between the relevant ministries and USAID on the appropriateness of improving such conditions.

Objective

The contractor will produce a report responding to the issues laid out in the Statement of Work. The study to be undertaken is for the purpose of arriving at a sound judgment as to whether and in what measure current transportation and/or communications infrastructure, policy, or regulations constitute an obstruction to real economic growth in Guatemala.

The approach we propose is to test as rigorously as possible the hypotheses that (1) shortages exist (excess quantities demanded) in the supply of commercial transportation services and communications services; and/or (2) the cost of providing available transportation and communication services is significantly higher or the quality significantly lower than those available in

other, competing countries; or (3) Guatemalan law, regulations, policies, or ingrained practices impede the private sector from supplying adequate transportation and communications systems at internationally competitive prices.

As the foregoing suggested hypotheses indicate, the study is envisioned as one to be carried out using the methods of economic analysis. It is recognized that data limitations are likely to preclude undertaking a rigorous econometric quantification of the transport and communications bottleneck. Nevertheless it is expected that the conceptual framework of the analysis will be rigorous and internally consistent. Concluding recommendations must be offered that flow clearly and logically from the conceptual analysis, and that are supported as fully as possible by data and other verifiable observations. Anecdotes must not be the principal evidence supporting conclusions and recommendations of the study. They may, however, prove highly useful in suggesting directions of inquiry and further study.

Scope of Work

The foregoing hypotheses seem to us to be plausible starting points. However, we wish to leave to the contractor sufficient flexibility to alter the approach if his/her own experience, or preliminary findings, so dictate. Consequently, any departures from the approach outlined here may be authorized by prior agreement between the contractor(s) and USAID/ Guatemala's Office of Economic Policy Analysis. The consultants should begin their work by examining the ROCAP study on regional transportation and should contact, among others, the Ministries of Transportation, Communications, Industry, Agriculture, public sector enterprises engaged in the two areas and private sector users engaged in export activities.

The report must address rigorously, but not necessarily be limited to the following questions:

Transportation

(1) Does a lack of availability of appropriate transport, on a timely basis, and/or at economically reasonable prices, constitute a problem in Guatemala, that constrains investment, and how serious is that problem compared to Mexico, other Central American countries, and developed countries?

(2) If the answer to (1) above is affirmative, is the problem confined to one or a few product categories or is it general across products?

(3) If the answer to (1) is affirmative, is it so for land, sea, and air transport or for only some forms?

(4) What are the causes of any problems in availability, quality, timeliness, or price, identified in answering (1) through (3) above?

(5) What actions, practices, laws, regulations, and policies require intervention by the public sector to remedy any transportation bottlenecks identified by the study?

(6) What (if anything) should be done by nongovernment entities to assist in finding a remedy to the transportation bottleneck (if any).

Communications

(7) Does an insufficiency of telecommunications services deter or slow foreign investment in Guatemala?

(8) If the answer to (7) above is affirmative, how does performance of the Guatemalan system compare with that in competing locations?

(9) If the answer to (7) is affirmative, what particular kinds of communications are deficient? What industries are adversely affected?

(10) What actions should be taken by the public sector to relieve any communications bottleneck identified?

Reports

Regardless of the approach finally agreed upon, the study must be completed within 3 months of the date the contract is signed. The contractor will present a written report within 2 weeks of arriving in country in which they describe the methodology they intend to use, the workplan with the specific tasks for each member, and any preliminary results they may have. A mid-mission briefing will be held during the fifth week unless otherwise agreed by the contractors and AID. A final briefing will be given to the Mission 1 week before the team's departure to allow for Mission comments and observations. The final report will be available within 1 month of the final briefing to the Mission and will encompass the Mission's suggestions and all findings, analyses, conclusions, and recommendations of the contractor.

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Method of Study

The study will be carried out using the methods of economic analysis. It is recognized that data limitations are likely to preclude undertaking rigorous econometric quantifications of the transportation and communications bottlenecks. However, data such as the frequency of flight cancellations and the limitations imposed by lack of space available—if such limitation exists—will be correctly analyzed. Finally, it is expected that the conceptual framework of the analysis will be rigorous and internally consistent.

Personnel

The team will be composed of the three professionals. The senior transportation economist should have a Ph.D. and expertise in transportation economics. Experience is required in evaluating transportation systems in Latin America. He will organize the study, direct the work of the team members, and prepare the final report. Spanish S-3/R-3

The senior communications economist should have a Ph.D. and expertise in communications economics. Experience is required in evaluating communications systems in Latin America. Spanish S-3/R-3

The Guatemalan member will provide expertise in public administration, helping the other team members in the identification of enterprises engaged in the transport and communications fields.

Roles and Responsibilities

The contractor will work on a day-to-day basis with a representative of OEPA.

Terms of Performance

Work will begin o/a January 15, 1990 and last 3 months. The final report acceptable in form and substance to USAID will be delivered no later than March 31, 1990.

Level of Effort

The contractor will supply six man-months. The transportation economist will organize the work and will guide the communications economist. While the two economists will be in Guatemala for 2 calendar months, they will be supported by a Guatemalan specialist in transportation and communications. The transportation economist will have an additional month to prepare the final document.

Appendix B

LA AURORA AND SANTA ELENA AIRPORTS

Introduction

GTTIS had available to it during conduct of the study the Draft Final Report, dated January 1990, for a "Study on the Development Project of La Aurora and Santa Elena Airports" (Airport Study) carried out by the Japan International Cooperation Agency (JICA). The study examined the existing airports, including their facilities, operation, and traffic, and assessed the need for short-term and long-term improvement of the airports to improve air traffic safety and to satisfactorily accommodate prospective higher volumes of traffic.

The purposes of this appendix are, first, to provide useful background information from the Airport Study on the two airports and their traffic and, second, to reexamine the findings and recommendations of the study. La Aurora Airport and Santa Elena Airport are discussed separately in the following sections of this appendix.

La Aurora Airport

The Airport Study assessed current airport operations to be unsafe; also, constraints on runway length, together with the elevation of the airport, impose take-off weight limitations on flights of medium and large jets. The airport is located just south of Guatemala City at an elevation of 1,510 meters above mean sea level. The runway is laid out almost due north and south (runways 01 and 19) and is 2,987 meters in length and 60 meters in width. The runway length needed to operate large jet aircraft at La Aurora elevation without take-off weight limitations would be 4,100 meters. The Airport Study indicates that it is not feasible to extend the runway in either direction because of urban area to the north and a sharp cliff to the south; it is also not feasible to reorient the runway because of mountains to the east and west (and in any case, the current orientation of the runway is appropriate

for prevailing winds). When runway 19 is used (which is most of the time because winds are predominantly from the south), the tall buildings of the urban area and an aqueduct make a threshold length of 225 meters of the runway unusable for landing, so that the effective length is only 2,762 meters for landing. Because of inadequate runway length, the loads of medium and large jets should be limited to 72 to 73 percent of maximum loads for long-distance flights (when the aircraft must take off with full fuel tanks).

The most dangerous aspect of La Aurora operation is the closeness of the centerlines of the runway and a parallel taxiway. According to the standards set by the International Civil Aviation Organization (ICAO), the centerline separation distance should be a minimum of 150 meters for visible flight rule (VFR) operation and 180 meters for instrument flight rule (IFR) operation. Because of the insufficient separation separation at La Aurora, theoretical runway capacity is currently 19 commercial operations per hour (if general aviation is not also being served) and, in practical terms, was estimated by the Airport Study at just 10 to 11 flights per hour, about the current peak hour traffic level. By shifting the taxiway to comply with ICAO standards for IFR operation, theoretical and practical peak hour commercial flight capacities could rise to 36 and 25, respectively.

Because of some obstructions in the ICAO standard approach paths, runway length limitations, the narrow separation of runway from taxiway, and also defects of the airport control tower and out-of-date radars "that have not been functioning properly," the Airport Study concluded that "safe operation of La Aurora airport is critically hampered," and that "it would not be a matter of surprise if an accident occurred causing serious casualties." During April and May, when frequent heavy fog occurs, the probability of visibility being less than 5 kilometers is in the range of 21 to 26 percent, and from May through October, more than 1,000 millimeters of rain falls in the average year. During November-March, when there is little rain or fog, air travel into and out of Guatemala City should be relatively safer than during the other 7 months of the year.

Because of the runway length limitation and the resultant take-off weight limitations, relatively few large jet aircraft serve La Aurora, and the Airport Study expects this situation to continue. The only air routes from Guatemala City to Europe are to the cities of Madrid and Amsterdam, operated by Iberia and KLM, respectively, and these services do employ large aircraft. To allow these flights to carry limited fuel out of Guatemala City and full loads across the Atlantic, the Iberia flights stop at Santo Domingo, Dominican Republic on the way to and from Madrid and the KLM flights call at Curacao on the way to and from Amsterdam.

Small jets (B-737, B-757, A-320, MD-80s) are used for 76 percent of all international services at La Aurora, or 79 percent of the Western Hemisphere flights. The Airport Study foresees little change through 1995, but a gradually decreasing role for this jet aircraft size thereafter, with increasing passenger

volume making it necessary to change over to medium jets (A-310, B-767). For domestic services, jets are used only if the flight extends to foreign cities. Currently domestic services are being operated by four Guatemalan airlines: AVIATECA, Aeroquetzal, Aerovias, and Tapsa.

The existing cargo terminal (a.k.a Express Aereo) has an area of 8,100 square meters, divided into two separate warehouses, and is just to the south of the main apron. The Airport Study reports that, although the original intention was apparently to use one of the warehouses for imports and the other for exports, in fact both buildings are used solely for imports. Outgoing shipments must be "stored" on a same-day basis on the apron. This is not a satisfactory situation for three reasons: first, the exporters must time their arrival with each flight departure in order to minimize losses, and "this causes a chaotic last minute rush of consolidation and palletization in the airport apron area; second, even without stockpiled export shipments on the apron, the apron is too small to effectively accommodate traffic, especially if latent demand is to be accommodated; and third, perishable commodities sitting on the apron tend to spoil, in heat and in rain. According to the Airport Study, "many airlines and cargo companies have expressed a willingness to increase the number of cargo charters and use larger aircrafts [sic]", but "such actions are not possible with the size of the existing apron."

To correct the cargo handling situation, the Airport Study recommends that one of the existing warehouses of 4,050 square meters be converted to an export cargo storage area, and that, in both warehouses a rack storage system be installed, two-tiered for heavy cargo (representing about 20 percent of imports and no exports) and four-tiered for light cargo. Refrigerated storage areas should be installed by the private sector cargo companies, in the view of the Airport Study.

Undoubtedly these recommended efforts to improve air cargo accommodation are desirable, and most or all of the other recommendations of the Airport Study to improve air traffic safety are probably needed in the short to medium run. The entire short-run (1991-1993) program for La Aurora airport improvement, however, was estimated by the study at more than U.S. $62 million, and the study's evaluation of the desirability of this program greatly overstated potential benefits. To make this evaluation, the study identified the year in which La Aurora would reach its absolute capacity utilization (1994, according to the study), after which no increments to growth were assumed to materialize; these "rejected" passengers were then presumed to suffer economic losses to the full value of their passenger fares. The full investment program was justified on the basis of the economic savings which would accrue to potentially rejected passengers who would be able to fly because of program implementation. There are several errors in this evaluation:

- Rejected passengers would not lose the full value of their fares if they could not fly to, from or within Guatemala. Instead, they would use the funds saved from being unable to fly for the next best use, suffering only the loss of the incremental value of their first choice of use (flying) compared with the value to them of their second choice of use for the funds.

- Absolute capacity utilization of La Aurora will not be reached in 1994, as, with the approach of airport capacity utilization, aircraft load factors will rise, and the peak period will spread out over an increased number of hours.

- Whenever growth of traffic threatens to reach capacity utilization, marginal users can be discouraged by raising fares in real terms. In the case of Guatemala, this would result in conversion of domestic and Central American traffic (currently about 30 percent of total traffic) to use of road, sea, and railway transport. Thus, the average "lost" fare for rejected passengers would not be equivalent to Guatemala City-Miami fare but to the combined monetary and nonmonetary losses of having to use a second choice transport mode.

- If La Aurora were to reach capacity utilization, the Government of Guatemala would have the options of employing one or both of the two military airports to accommodate some civilian air flights. (This is probably a good idea for the Caribbean coast airport, in any case, as discussed in Chapter 6 of this report.)

- Santa Elena Airport, which already has a longer runway than La Aurora, could be improved to accommodate any excess traffic which absolutely could not be handled at La Aurora (the Airport Study, in fact, recommends that Santa Elena be developed as the alternative airport to La Aurora, and it was internally inconsistent of the study, therefore, not to consider how implementation of the Santa Elena airport development program would affect the study's estimates of return on La Aurora development—see the discussion in the following section of this appendix).

- Long-distance travelers would have the option, if flights were fully booked at all Guatemalan airports, of using an airport in El Salvador, Honduras, or Mexico and moving to and from Guatemala by road.

- Even if the Airport Study had conisdered all options, it would still have been inappropriate for the study to combine the many and varied investments it was proposing in a single project. Separate evaluation of the cargo terminal (a low-cost project, because existing buildings would be used), replacement and improvement of navigational aids (navaids), and perhaps apron enlargement, as well, probably would have been found to be immediately justified, whereas the costly project of moving the taxiway probably could be deferred for several years.

Santa Elena Airport

Santa Elena serves the town of Flores in the department of El Peten, and primarily accommodates tourists who are visiting the Mayan ruins at Tikal. Approximately 100,000 passengers (i.e., equivalent to 50,000 round-trips) are currently accommodated at Santa Elena. Cargo volumes at Santa Elena are under 1,000 tons per year. Two airlines, Aerovias and Aeroquetzal, provide scheduled domestic services to Santa Elena, and Aeroquetzal also provides scheduled international services, operating to Cancun, Mexico. Both airlines also provide chartered services, as do AVIATECA and Tapsa. Charter flights include flights to Belize. Because of the flights between Santa Elena and the Cancun and Belize airports, Santa Elena is an international airport, with immigration and customs inspection. Aerovias provides services with Twin Otter and Dart Herald aircraft, with seating for somewhat fewer than 50 passengers; Aeroquetzal employs a somewhat larger DC-9, which is expected (by the Airport Study) to be phased out by 1995 in favor of B-737 small jet aircraft.

The Santa Elena airport was established a decade ago and opened to traffic in 1981. Improvement was implemented in 1987, with the installation of basic navaids and telecommunications. The airport is at an elevation of just 123 meters above mean sea level, and has good visibility throughout most the year, with a few periods of low visibility only in May.

The runway at Santa Elena is concrete-paved, 3,000 meters in length with over-runs at both ends, and 45 meters wide with 7.5-meter shoulders on both sides. Extension of the runway, if that were necessary, is possible in the eastward direction (runways are 10 and 28). According to the Airport Study, the apron parking capacity "appears to be inadequate to handle

medium and large jets," which is not a problem at present, but might become one if Santa Elena needed to serve any long-distance international traffic. Nevertheless, the study concluded after its investigation of Santa Elena that "Santa Elena airport has the basic infrastructure to serve as an alternative aerodrome to La Aurora within the national territory."

If Santa Elena is to be a satisfactory international airport, however, some improvement of facilities and some new equipment are required. The airport should have a back-up power system; runway and apron overlays are needed because of past inattention to routine maintenance; and the passenger terminal needs to be expanded and improved. The improvement program, with price and physical contingencies and capitalized interest during construction, would cost about U.S. $4.54 million. Feasibility of the investment would depend, according to the study, on implementation of an integrated program to fully develop El Petén tourism.